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Australian Curriculum, Assessment and Reporting Authority (ACARA) Educational Relevance Statement (Years 7, 8, 9, 10)

Welcome to our Relevance Statement for the Forensic Science Workshops “**A Case of Identity**” (COI) and “**A Case of Conspiracy?**” (COC). Though they tell different stories the bulk of the displays have been designed to meet common objectives. Where a certain outcome is met by one workshop but not the other, it will be noted as *COI Only* or *COC Only*. The supplied teacher resources are the same for both programmes.

Here at EI while we are all about promoting science and ensuring the students are engaged and entertained through our **interactive** workshops, we also take the **education** aspect of our name and what we do very seriously. We have two qualified Forensic Scientists who run the company, and we consult heavily with teachers, schools, education professionals and universities during the development of our programmes.

Our Forensic Science presentations, teacher resources, and worksheets have been designed to meet the educational requirements of secondary school science using the ACARA National Curriculum for Science as a guideline. Relevant points from the **Key Learning Areas (Science Understanding, Science as a Human Endeavour, and Science Inquiry Skills)** for each year level addressed by our programmes and related resources are listed in this document.

The following listings are drawn directly from the National ACARA Curriculum for Secondary School Science (<http://www.australiancurriculum.edu.au/Science/Curriculum/F-10>). Through the deductive process of solving a crime, interacting with our hands on displays, and engaging with the presenter and background materials, students will make progress towards achieving the listed syllabus outcomes.

While far from exhaustive, look for comments we have added in **RED** providing specific examples of how our workshop will address certain points. Being Forensics, we are naturally leaning towards the “**Science Inquiry Skills**” section quite heavily.

A comprehensive set of **Additional Teacher’s Resources** are included with all workshop bookings. While these are optional for the schools to use, the related information, experiments and activities available are available for download from our website. These resources address even more of the curriculum than we could squeeze into a 60-90 minute workshop.

Thank You.

Kate Harvey and Bronte Black
Managers
Education Interactive

Year 7

Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Biological Sciences	Nature and Development of Science	Questioning and Predicting
		<p>Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (AC SIS124)</p> <ul style="list-style-type: none"> working collaboratively to identify a problem to investigate <p><i>Students will work in small groups in our open ended investigation. They will have to identify the various problems that lead to an overall conclusion.</i></p> <ul style="list-style-type: none"> recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation <p><i>Both of our workshops are centred on social issues affecting teens. COI deals with Drink Spiking & Cyber Safety, COC educates on the dangers of drug use.</i></p> <ul style="list-style-type: none"> using information and knowledge from previous investigations to predict the expected results from an investigation <p><i>Students will draw on previous knowledge from school science and be provided with relevant Forensics data to make informed predictions during their investigation.</i></p>

Chemical Sciences	Use and Influence of Science	Planning and Conducting
<p>Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques (ACSSU113)</p> <ul style="list-style-type: none"> recognising the differences between pure substances and mixtures and identifying examples of each identifying the solvent and solute in solutions Investigating and using a range of physical separation techniques such as filtration, decantation, evaporation, crystallisation, distillation and chromatography. <p><i>Chromatography plays a massive role in Forensics and features heavily in both workshops. It also addressed in the Teacher Resources.</i></p>	<p>Science understanding influences the development of practices in areas of human activity such as industry, agriculture and marine and terrestrial resource management (ACSHE121)</p> <ul style="list-style-type: none"> investigating everyday applications of physical separation techniques such as filtering, sorting waste materials, reducing pollution, extracting products from plants, separating blood products and cleaning up oil spills 	<p>Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (ACSIS125)</p> <ul style="list-style-type: none"> working collaboratively to decide how to approach an investigation <p><i>After initial case background is given, students will have complete freedom to choose the approach to their investigation from many potential pathways.</i></p> <p>In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (ACSIS126)</p> <ul style="list-style-type: none"> recognising the differences between controlled, dependent and independent variables <p><i>Fair tests and variables are covered in experiments in our Teachers Resources Pack.</i></p>
Earth and Space Sciences		Processing and Analysing Data and Information
		<p>Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships, including using digital technologies as appropriate (ACSIS129)</p> <ul style="list-style-type: none"> describing the trends shown in collected data <p>Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions (ACSIS130)</p> <ul style="list-style-type: none"> identifying data which provides evidence to support or negate the hypothesis under investigation <p><i>Not all the provided evidence supports a single hypothesis. Students will have to decide this for themselves.</i></p>

		<ul style="list-style-type: none"> referring to relevant evidence when presenting conclusions drawn from an investigation <p>At the conclusion of the workshop students are required to not only provide a murderer, but solid physical evidence to support their claim.</p>
Physical Sciences		Evaluating
<p>Change to an object's motion is caused by unbalanced forces acting on the object (ACSSU117)</p> <ul style="list-style-type: none"> investigating the effects of applying different forces to familiar objects <p>Reconstructing the last moments of life and the cause of death will require students to consider the motion of the persons and evidence and the forces in play.</p>		<p>Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method (AC SIS131)</p> <ul style="list-style-type: none"> discussing investigation methods with others to share ideas about the quality of the inquiry process identifying and considering indicators of the quality of the data when analysing results <p>Students will be asked to evaluate the strength of the evidence and how this will affect their conclusions.</p> <p>Use scientific knowledge and findings from investigations to evaluate claims (AC SIS132)</p> <ul style="list-style-type: none"> using the evidence provided by scientific investigations to evaluate the claims or conclusions of their peers <p>Students will work in small teams who are in friendly competition. They will be asked to raise objections to or confirm the ideas of other groups by referencing their own work.</p>
		Communicating
		<p>Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies (AC SIS133)</p> <ul style="list-style-type: none"> presenting the outcomes of research using effective forms of representation of data or ideas and scientific language that is appropriate for the target audience

Year 8

Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Biological Sciences	Nature and Development of Science	Questioning and Predicting
		<p>Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge (AC SIS139)</p> <ul style="list-style-type: none"> recognising that the solution of some questions and problems requires consideration of social, cultural, economic or moral aspects rather than or as well as scientific investigation <p><i>Both of our workshops are centred on social issues affecting teens. COI deals with Drink Spiking & Cyber Safety, COC educates on the dangers of drug use.</i></p> <ul style="list-style-type: none"> using information and knowledge from their own investigations and secondary sources to predict the expected results from an investigation <p><i>Students will draw on previous knowledge from school science and be provided with relevant Forensics data to make informed predictions during their investigation.</i></p>
Chemical Sciences	Use and Influence of Science	Planning and Conducting
<p>Differences between elements, compounds and mixtures can be described at a particle level (ACSSU152)</p> <ul style="list-style-type: none"> recognising that elements and simple compounds can be represented by symbols and formulas <p>Chemical change involves substances reacting to form new substances (ACSSU225)</p> <ul style="list-style-type: none"> identifying the differences between chemical and physical changes identifying evidence that a chemical change has taken place 	<p>People use understanding and skills from across the disciplines of science in their occupations (ACSHE227)</p> <ul style="list-style-type: none"> recognising the role of knowledge of the environment and ecosystems in a number of occupations <p><i>COI investigates the role of the Forensic Entomologist and how their knowledge of insects and ecosystems helps to solve crimes.</i></p>	<p>Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed (AC SIS140)</p> <ul style="list-style-type: none"> working collaboratively to decide how to best approach an investigation <p><i>After initial case background is given, students will have complete freedom to choose the approach to their investigation from many potential pathways.</i></p>

<ul style="list-style-type: none"> investigating simple reactions such as combining elements to make a compound <p><i>Our Teacher Resources include a unit on simple chemical reactions and identification in a Forensic context.</i></p>		<p>In fair tests, measure and control variables, and select equipment to collect data with accuracy appropriate to the task (AC SIS141)</p> <ul style="list-style-type: none"> using specialised equipment to increase the accuracy of measurement within an investigation identifying and explaining the differences between controlled, dependent and independent variables <p><i>Fair tests and variables are covered in experiments in our Teachers Resources Pack. These experiments include the use of specialised measurement equipment</i></p>
<p>Earth and Space Sciences</p>		<p>Processing and Analysing Data and Information</p>
		<p>Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions (AC SIS145)</p> <ul style="list-style-type: none"> drawing conclusions based on a range of evidence including primary and secondary sources <p><i>There are more than 10 displays each containing several potential pieces of evidence for the students the students have to combine to reach their final conclusion as to who the murderer is.</i></p>
<p>Physical Sciences</p>		<p>Evaluating</p>
		<p>Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method (AC SIS146)</p> <ul style="list-style-type: none"> discussing investigation methods with others to share ideas about the quality of the inquiry process <p><i>This is achieved through their group work and in conversation with the presenter.</i></p>

		<p>Use scientific knowledge and findings from investigations to evaluate claims (ACSYS234)</p> <ul style="list-style-type: none"> • identifying the scientific evidence available to evaluate claims • deciding whether or not to accept claims based on scientific evidence <p><i>The understanding of “what is evidence” and its correct interpretation are fundamental to our workshops.</i></p>
		Communicating

Year 9

Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Biological Sciences	Nature and Development of Science	Questioning and Predicting
	<p>Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries (ACSHE158)</p> <ul style="list-style-type: none"> considering how common properties of electromagnetic radiation relate to its uses, such as radar, medicine, mobile phone communication and microwave cooking <p><i>Students can explore how properties of the electromagnetic spectrum can be used by forensics in detection, imaging, and analysis of evidence.</i></p>	<p>Formulate questions or hypotheses that can be investigated scientifically (AC SIS164)</p> <ul style="list-style-type: none"> developing ideas from students own or others' investigations and experiences to investigate further <p><i>The multi layered design of our Crime Scene allows students to delve continually deeper as their simple investigations produce further paths of inquiry.</i></p>
Chemical Sciences	Use and Influence of Science	Planning and Conducting
<p>Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed (ACSSU178)</p> <ul style="list-style-type: none"> identifying reactants and products in chemical reactions describing observed reactions using word equations chemical reactions can be demonstrated by simple chemical equations <p><i>Our Teacher Resources include a unit on simple chemical reactions and equations in a Forensic context.</i></p> <p>Chemical reactions, including combustion and the reactions of acids, are important in both non-living and living systems and involve energy transfer (ACSSU179)</p> <ul style="list-style-type: none"> recognising the role of oxygen in combustion reactions and comparing combustion with other oxidation reactions <p><i>COC Only – Students investigate the causes and propagation of fire in an Arson investigation.</i></p>	<p>People can use scientific knowledge to evaluate whether they should accept claims, explanations or predictions (ACSHE160)</p> <ul style="list-style-type: none"> using knowledge of science to test claims made in advertising or expressed in the media <p><i>While we hope it is still entertaining, we do try to press the differences between 'real' Forensics and what students see on the news and CSI!</i></p> <p>The values and needs of contemporary society can influence the focus of scientific research (ACSHE228)</p> <ul style="list-style-type: none"> considering how technologies have been developed to meet the increasing needs for mobile communication <p><i>Not only do we consider the rise of mobile communication technology, we investigate its use in both a social and forensic context.</i></p>	

Earth and Space Sciences		Processing and Analysing Data and Information
		<p>Use knowledge of scientific concepts to draw conclusions that are consistent with evidence (AC SIS170)</p> <ul style="list-style-type: none"> • comparing conclusions with earlier predictions and reviewing scientific understanding where appropriate • suggesting more than one possible explanation of the data presented <p><i>The ultimate success of the students Forensic Investigation will be how well they are able to explain all aspects of the crime using the evidence gathered and interpreted during the workshop. While there is a 'correct' answer, multiple possibilities could be reasonably argued.</i></p>
Physical Sciences		Evaluating
<p>Energy transfer through different mediums can be explained using wave and particle models (ACSSU182)</p> <ul style="list-style-type: none"> • exploring how and why the movement of energy varies according to the medium through which it is transferred <p><i>COI Only – Students investigate the properties of light waves in relation to Glass Refractive Index Measuring.</i></p>		<p>Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data (AC SIS171)</p> <ul style="list-style-type: none"> • identifying gaps or weaknesses in conclusions (their own or those of others) • identifying alternative explanations that are also consistent with the evidence <p><i>There are always (at least) 2 possible explanations for how a piece of Forensic evidence came to be. Students are encouraged to examine both points of view when determining the more likely explanation and state reasons for their choices.</i></p>
		Communicating

		<p>Communicate scientific ideas and information for a particular purpose, including constructing evidence-based arguments and using appropriate scientific language, conventions and representations (AC SIS174)</p> <ul style="list-style-type: none">• presenting results and ideas using formal experimental reports, oral presentations, slide shows, poster presentations and contributing to group discussions <p><i>Students will be tasked with completing a guided Forensic Report in the form of a worksheet, and to contribute their findings to the group.</i></p>
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Year 10

Science Understanding	Science as a Human Endeavour	Science Inquiry Skills
Biological Sciences	Nature and Development of Science	Questioning and Predicting
<p>The transmission of heritable characteristics from one generation to the next involves DNA and genes (ACSSU184)</p> <ul style="list-style-type: none"> describing the role of DNA as the blueprint for controlling the characteristics of organisms using models and diagrams to represent the relationship between DNA, genes and chromosomes <p><i>DNA is a key focus point in the Biology Section of our workshops. Students will further knowledge on its makeup, function, and use in Forensics.</i></p>	<p>Advances in scientific understanding often rely on developments in technology and technological advances are often linked to scientific discoveries (ACSHE192)</p> <ul style="list-style-type: none"> recognising that the development of fast computers has made possible the analysis of DNA sequencing, radio astronomy signals and other data considering how information technology can be applied to different areas of science such as bioinformatics and the Square Kilometre Array <p><i>Students will experience the outcomes of advancement in computing technology as it relates to both DNA and Fingerprint analysis.</i></p>	<p>Formulate questions or hypotheses that can be investigated scientifically (ACSI198)</p> <ul style="list-style-type: none"> developing hypotheses based on well-developed models and theories formulating questions that can be investigated within the scope of the classroom or field with available resources developing ideas from students own or others' investigations and experiences to investigate further <p><i>The multi layered design of our workshops allows the older students to develop their own questions to answer and ideas to investigate rather than be completely driven by the presenter.</i></p>
Chemical Sciences	Use and Influence of Science	Planning and Conducting
	<p>The values and needs of contemporary society can influence the focus of scientific research (ACSHE230)</p> <ul style="list-style-type: none"> recognising that financial backing from governments or commercial organisations is required for scientific developments and that this can determine what research is carried out <p><i>We explain how forensics mostly a government powered industry and most developments have come on the back of the need for better services to society in terms of solving crime.</i></p>	

Earth and Space Sciences		Processing and Analysing Data and Information
		<p>Use knowledge of scientific concepts to draw conclusions that are consistent with evidence (AC SIS204)</p> <ul style="list-style-type: none"> • using primary or secondary scientific evidence to support or refute a conclusion • constructing a scientific argument showing how their evidence supports their claim <p><i>The final outcomes of the workshops require older students to not only provide answers to the questions they developed at the start of their investigation, but also provide sound scientific reasoning, backed up by hard physical evidence.</i></p>
Physical Sciences		Evaluating
		<p>Evaluate conclusions, including identifying sources of uncertainty and possible alternative explanations, and describe specific ways to improve the quality of the data (AC SIS205)</p> <ul style="list-style-type: none"> • evaluating the strength of a conclusion that can be inferred from a data set <p><i>Students are asked to evaluate the strength of various types of evidence including the difference between “class” and “individual” characteristics.</i></p> <ul style="list-style-type: none"> • identifying alternative explanations that are also consistent with the evidence <p><i>There are always (at least) 2 possible explanations for how a piece of Forensic evidence came to be. Students are encouraged to examine both points of view when determining the more likely explanation and state reasons for their choices.</i></p>

The above learning areas are covered either during the presentations or in the “Teachers Resources” which are available online and included as part of your package when you book a workshop with us. Not every point will be covered in every show. Specific focus can be given to certain areas on request.