Name	Period	Assignment #	
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What makes a justification sound?

Analysis

Detailed examination of the elements or structure of something

Interpretation

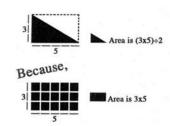
Explaining the meaning of something



Justification

Showing something to be right or reasonable based on verifiable evidence





The 3 elements of a valid justification

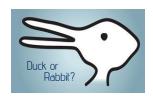
Specific data from analysis related to knowledge

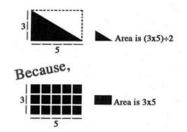
Explanation of HOW the data relate to knowledge

Guiding Question: Who does the bachelorette want to marry?			
Our Claim:	Our Claim:		
Our Evidence:	Our Justification of the Evidence:		
Analysis: break it down (What did you see and hear? Body language, tone, etc.)	Use your analysis and worldly knowledge to support your interpretation		
Interpretation: What does the analysis mean?			

How are analysis, interpretation, and justification different?







Examples of analysis from the bachelorette	Examples of interpretation from the bachelorette	Example of one complete justification from the bachelorette

What is the difference between correlation and causation?

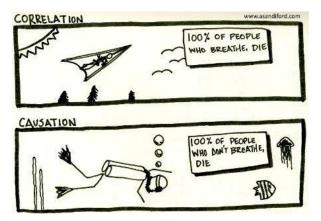
Correlation

A relationship between two variables

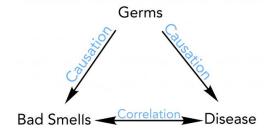
Causation

A variable causes a change in another variable in a predictable way

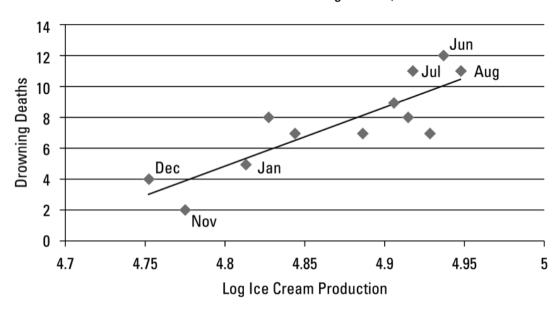
Explain the difference between correlation and causation using the cartoon below.



Explain the difference between correlation and causation using the diagram below.



Ice Cream and Drowning Scatter, 2006

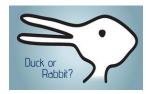


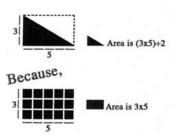
The 3 Elements of a Valid Justification

WHAT IT IS WHAT YOU ARE DOING Theory or known Background knowledge Paraphrasing established scientific usually given in pre-lab fact and/or theory reading knowledge Specific data from analysis of the experiment Connecting data to theory Data from your related to the or knowledge experiment theory or scientific knowledge Explaining the relationship between the data and Explanation of theory or knowledge Your understanding of HOW the data how the data APPLYto the theory or relate to the Identifying weaknesses in knowledge experimental design and/or theory or execution IF the data are scientific not in line with theory or knowledge knowledge

Guiding Question: What causes drownings?		
Our Claim:		
Our Evidence:	Our Justification of the Evidence:	
Analysis: break it down (Illustrate and describe your data)	Use your analysis and worldly knowledge to support your interpretation	
Interpretation: What does the analysis mean?		
interpretation. What does the analysis mean:		

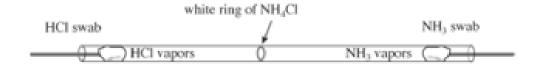




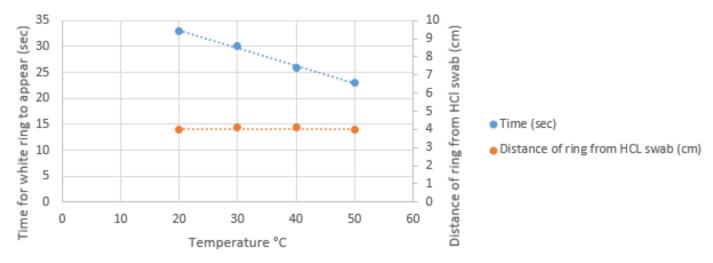


Examples of analysis from drowning data	Examples of interpretation from drowning data	Example of one complete justification from from drowning data

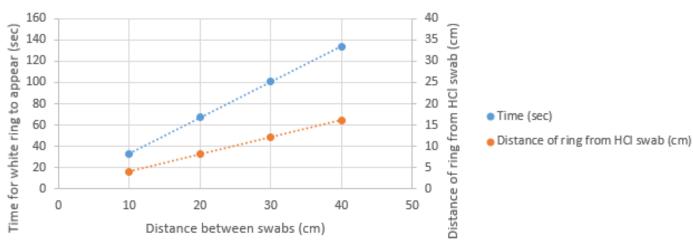
All molecules are in constant motion. Molecules in liquids and gases bump into each other causing them to change directions. These direction changing collisions and constant motion cause diffusion. Diffusion is the net movement of molecules from relatively high concentrations towards lower concentrations. The rate of diffusion of a given molecule is dependent on the mass and kinetic energy (energy of motion) of the molecule. Temperature measures the average kinetic energy of matter. HCl has a molecular weight of 36.5g/mol. NH₃ has a molecular weight of 17.0g/mol. Both HCl and NH₃ readily evaporate under typical laboratory conditions. HCl reacts with NH₃ forming a white solid (NH₄Cl). Cotton swabs soaked in HCl and NH₃ were simultaneously placed at opposite ends of a 10cm glass tube. See below. The appearance of the white ring tells us where the molecules of HCl and NH₃ met, and therefore how far each traveled in the same amount of time.



The dependance of diffusion rate on temperature at constant glass tube length



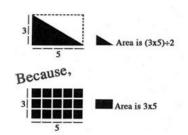
The dependence of diffusion rate on tube length at constant temperature



Guiding Question: What affects the rate of diffusion?		
Our Claim:		
Our Evidence:	Our Justification of the Evidence: Use your scientific knowledge and analysis to support your interpretation	







Examples of analysis from diffusion experiment	Examples of interpretation from diffusion experiment	Example of one complete justification from diffusion experiment