



THE NATURE OF SCIENCE

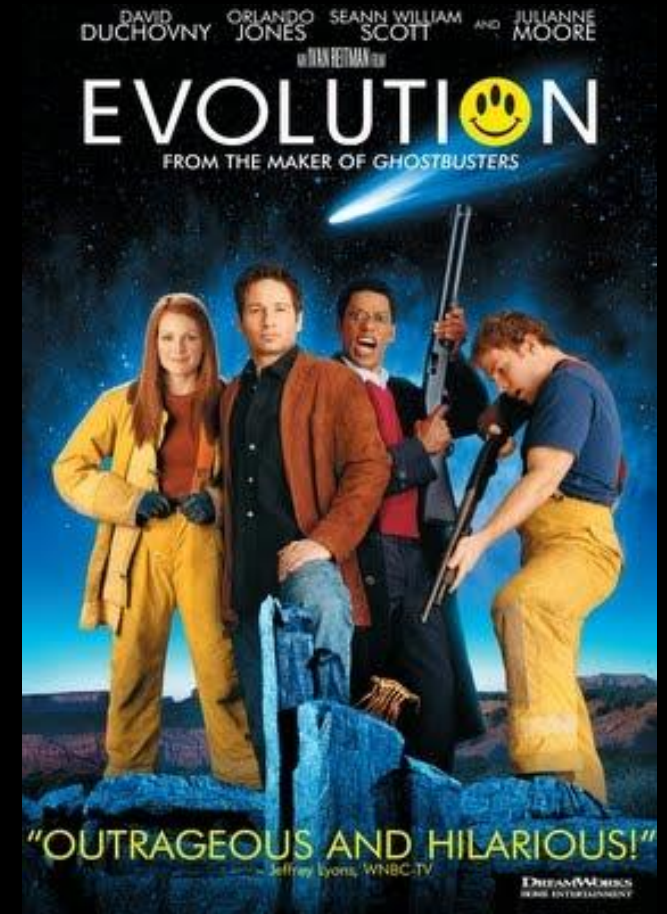
IPC Chapter 1 – Section 1

What Is Science?

- Science is the use of scientific inquiry to form testable explanations and make predictions about studying the natural world.
- Major categories of Science:
 - Life science (living things)
 - Earth science (Earth and space)
 - Physical science (matter and energy)
- Science changes as more is learned (ex. Atomic theory)

Scientific Method

- Ask Questions and State the Problem
- Research and Gather Information
- Form a Hypothesis
- Test a Hypothesis
- Analyze the data and Form Inferences
- Draw Conclusions
 - Eliminate bias
- Peer review



Data collection during experiments

- Accuracy – how close a group of measurements are to the real or accepted value
- Precision – how close a group of measurements are to each other.
- Organize your data as you are recording it. (Data tables)

In the Lab

- Use reusable equipment and tools
- Use small quantities of resources
- Dispose of wastes properly

Room Temperature			
Time (min)	Classroom Temperature (°C)		
	A	B	C
0	16	16	16
5	17	17	16.5
10	19	19	17
15	20	21	17.5
20	20	23	18

Lab Safety

- MSDS sheets (Material Safety Data Sheets)
- Safety Symbols

HAZARD AWARENESS CHART

HAZARD CLASSIFICATIONS



HEALTH HAZARD FIRE HAZARD
SPECIFIC HAZARD REACTIVITY

HAZARD INDEX

	FIRE HAZARD
	HEALTH HAZARD
	REACTIVITY

4 - SEVERE HAZARD
3 - SERIOUS HAZARD
2 - MODERATE HAZARD
1 - SLIGHT HAZARD
0 - MINIMAL HAZARD

PERSONAL PROTECTION PICTOGRAMS

Safety Goggles	Face Shield	Apron	Dust Mask	Vapour Respirator
Self-Contained Air Respirator	Gloves	Boots	Full Protection Suit	No Smoking

HAZARD SYMBOLS

Compressed Gas	Flammable Material	Oxidizing	Explosion Hazard	Harmful or Fatal
Biohazardous/Infectious	Corrosive	Health Hazard	Harmful	Harmful to the Environment



Health	2
Fire	1
Reactivity	0
Personal Protection	H

Material Safety Data Sheet Eugenol MSDS

Section 1: Chemical Product and Company Identification

<p>Product Name: Eugenol Catalog Codes: SLE1156 CAS#: 97-53-0 RTECS: SJ4375000 TSCA: TSCA 8(b) inventory: Eugenol CI#: Not available. Synonym: Hydroxy-1-methoxy-2-allyl-4-benzene Chemical Formula: C10H12O2</p>	<p>Contact Information: Sciencelab.com, Inc. 14025 Smith Rd. Houston, Texas 77396 US Sales: 1-800-901-7247 International Sales: 1-281-441-4400 Order Online: ScienceLab.com CHEMTREC (24HR Emergency Telephone), call: 1-800-424-9300 International CHEMTREC, call: 1-703-527-3887 For non-emergency assistance, call: 1-281-441-4400</p>
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Section 2: Composition and Information on Ingredients

Composition:

Name	CAS #	% by Weight
Eugenol	97-53-0	100

Toxicological Data on Ingredients: Eugenol: ORAL (LD50): Acute: 1930 mg/kg [Rat]. 3000 mg/kg [Mouse]. 2130 mg/kg [Guinea pig].

Section 3: Hazards Identification

Potential Acute Health Effects:
 Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

Potential Chronic Health Effects:
 Hazardous in case of skin contact (irritant), of ingestion, of inhalation. CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Not available. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance is toxic to lungs, the nervous system, mucous membranes. Repeated or prolonged exposure to the substance can produce target organs damage.

Section 4: First Aid Measures

Eye Contact: Check for and remove any contact lenses. Do not use an eye ointment. Seek medical attention.

Evaluating Scientific Explanations

- Analyze (break down the scientific explanation into its parts)
- Evaluate (study the scientific explanation and its parts; consider what you know about the topic; look at the scientific methods used to support the explanation)
- Critique (review and consider the merits and faults of the explanation and its parts)

Using Models

- Models are used to represent things that are too large or too small
- Models are also used to explain difficult concepts
- Models can also simulate real world situations

Scientific Theory

- Is NOT a guess
- Is an explanation of some aspect of the natural world that has been substantiated through repeated experiments or testing.
 - Ex) the theory of plate tectonics

Scientific Law

- A statement about what happens in nature that seems to be true all the time.
- Tell you what will happen under certain conditions
- Don't explain why or how something happens

Limitations of Science

- Science doesn't answer questions about emotions, values, or beliefs
- In order for something to be science, it must be able to be tested and found to be supported or not supported.