

Grade 11 Physical Sciences Practical: Intermolecular Forces

CAPS & NSC Aligned | 100 Minutes | 25 Learners in 5 Groups

Teacher Version

This practical investigation allows learners to explore the relationship between intermolecular forces (IMF) and physical properties: evaporation (volatility), surface tension, and miscibility. Learners rotate through three stations, collect data, and complete an individual write-up worth 40 marks.

Timing: 100 min

- 0–10 min: Introduction, safety briefing, station overview
- 10–70 min: Station rotations (20 min per station)
- 70–75 min: Pack-up
- 75–100 min: Individual write-up

Grouping: 25 learners → 5 groups of 5

Materials Required

Liquid	Per Group	Class Total (5 Groups)
Water (pure)	20 mL	100 mL
Water + detergent (pre-mix)	10 mL	50 mL
Ethanol (methylated spirits)	20 mL	100 mL
Propan-2-ol (isopropyl)	5 mL	25 mL
Glycerol	5 mL	25 mL
Cooking oil	20 mL	100 mL

Safety Precautions

- Wear goggles and gloves at all times.
- No flames — ethanol and propan-2-ol are flammable.
- Do not ingest or touch chemicals with bare hands.
- Wipe spills immediately to avoid slips.
- Dispose of mixed liquids into labelled waste beakers — follow school policy.

Stations

Station A — Evaporation (Volatility) vs IMF

Liquids: water, ethanol, propan-2-ol, glycerol. Measure 0.50 mL (or 10 drops) into watch glasses. Record time to dryness. Repeat for one liquid.

Station B — Surface Tension (Drops-on-a-Coin) vs IMF

Liquids: water, water + detergent, ethanol. Drop from 2 cm height onto a coin until it spills. Record maximum drops. Repeat for water.

Station C — Miscibility vs IMF & Polarity

Liquids: water (with food colouring), cooking oil, ethanol. Test water + oil, then add ethanol; also test ethanol + oil. Record miscibility and layer positions.

Physical Science Paper 2 Intermolecular Forces Investigation

ML Morrison



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Proceedings of the Royal Society. Section A, Mathematical and Physical Science Royal Society (Great Britain),1908
Science Abstracts ,1921 **The Chemical News : and Journal of Physical Science** ,1894 *Research in Education*
,1972 *Resources in Education* ,1972-10 Soviet Physics ,1957 **Nature** Sir Norman Lockyer,1922 **Colloid**
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Annual Report - University of Wisconsin--Madison, Engineering Experiment Station University of
Wisconsin--Madison. Engineering Experiment Station,1978 **The Electrician** ,1890

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