

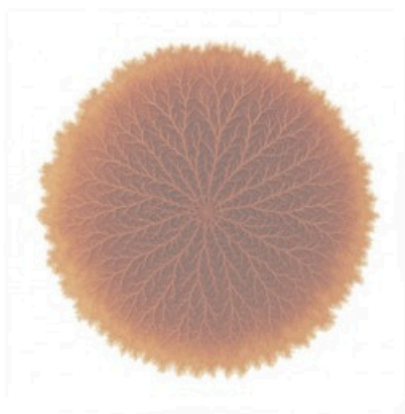
Reactive Surface Experiments (RSE)

Classroom Field Kit

A Shared Laboratory

Reactive Surface Experiments — Commons Edition

Program 1 — The Laws Of entry & Travel



From here all else follows

Program 1 — The Laws That govern Entry and movement

Reactive Surface Experiments™ Foundation Module

Program Purpose

This program establishes the single most important principle in Reactive Surface Experiments:

Color does not sit on the surface — it enters, travels, and becomes the surface.

Students will learn that every visible outcome in RSE work is governed not by the chemical alone, but by **how and when the solution is allowed to enter the substrate.**

This program introduces the **Laws of Entry** and extends into the **Laws of Travel**, forming the complete behavioral model for reactive color.

Learning Objectives

By the end of this program, participants will:

- Understand that **entry condition controls outcome**
- Recognize the difference between **absorption and reaction**
- Identify key surface states (Dry, SSD, SSW)
- Observe how fluid movement creates **pattern, not randomness**
- Begin reading RSE cards using diagnostic language:
 - Entry ring
 - Solvent front
 - Precipitation boundary
 - Core saturation

Core Principle

Only what enters will react.

If the solution does not enter the substrate correctly, no chemistry — no matter how sophisticated — will produce meaningful or stable results.

The Laws of Entry (RSE Adapted)

These are not suggestions. They are constraints.

LE-I — The Surface State Law

The substrate condition determines if entry is possible.

- **Dry** → pulls aggressively, often unevenly
- **SSD (Saturated Surface Dry)** → ideal controlled entry
- **SSW (Surface Saturated Wet)** → blocks entry, causes pooling

In RSE, **SSD is the gate.**

LE-II — The Gate is Temporal

Entry is time-dependent and closes quickly.

- The moment fluid touches the surface, change begins
- Hydration, swelling, or saturation reduces permeability
- Late application ≠ early application

You are not placing color — you are racing the clock.

LE-III — The Bus Capacity Law

The substrate can only accept a finite load.

- Once pores are filled, additional solution stays on the surface
- Excess leads to:
 - Bloom collapse
 - Surface staining instead of internal reaction

When the bus is full, nothing else gets on.

LE-IV — Concentration Controls Behavior

Dilution affects movement more than color intensity.

- High concentration:
 - Short travel
 - Strong edge definition
- Low concentration:
 - Long travel
 - Diffuse gradients

In RSE, dilution is a *movement control tool*, not just a color control.

LE-V — Path Defines Pattern

The way solution is introduced determines geometry.

Three primary entry modes:

1. **Point Load (Drop / Pipette)** → Radial blooms
 2. **Continuous Feed (Felt Tip / Capillary)** → Expanding fields
 3. **Reservoir Feed (Chromatography Strip)** → Vertical migration
- Pattern is not decoration — it is a map of entry physics.

LE-VI — Escort Ion Law

Companion ions influence entry and reaction behavior.

- Nitrates, chlorides, acetates alter:
 - Mobility
 - Penetration depth
 - Reaction speed

The visible color is only part of the system — the invisible ions decide how it moves.

Transition: From Entry to Travel

Once inside, control shifts.

Entry decides if the reaction begins. Travel decides what it becomes.

The Laws of Travel (RSE Foundation)

LT-I — Movement Precedes Reaction

Fluids move before they react.

- The leading edge is often clear (solvent front)
 - Reaction happens behind or at boundaries
- What you see is delayed — the chemistry is already ahead.

LT-II — Evaporation Creates Boundaries

Drying concentrates solutes and forms rings.

- Leads to:
 - Precipitation rings
 - Edge darkening
 - Liesegang-like banding

The edge is where decisions are made.

LT-III — Resistance Shapes Form

The substrate is not uniform — it redirects flow.

- Fiber density
- Pore variation
- Compression zones

The surface is a terrain, not a plane.

LT-IV — Precipitation Locks the System

Once a reaction solidifies, movement stops.

- Forms:
 - Walls
 - Dams
 - Arrest rings

These are not artifacts — they are the record of where chemistry ended.

LT-V — Oxygen and Environment Modify Outcomes

External conditions alter internal reactions.

- Oxygen exposure
- Humidity
- Temperature

The same solution can produce different results in different environments.

Practical Exercise — The Entry Test Card

Objective

To observe how entry condition alone changes outcome.

Method

Prepare 3 identical RSE sheets:

1. **Dry Sheet**
2. **SSD Sheet**
3. **SSW Sheet**

Apply identical drops of the same solution (e.g., copper or iron salt).

Observe

- Spread radius
- Edge sharpness
- Internal pattern
- Color density

Expected Insight

- Dry → aggressive, chaotic pull
 - SSD → controlled bloom, readable structure
 - SSW → weak, diluted, surface-heavy result
- This single test teaches more than ten recipes.

Reading an RSE Card (Intro)

Students should begin identifying:

- **Entry Ring** — initial contact boundary
- **Solvent Front** — outer wetting edge
- **Precipitation Wall** — darkened ring of accumulation
- **Core Zone** — area of saturation

This is the beginning of **RSE literacy**.

Program Outcome

At completion, students should understand:

- Why most surface coloring methods fail
- Why repetition without control produces noise
- That **mastery begins at the moment of entry**

The surface is not passive. It decides what it will accept, when it will accept it, and how far it will carry it.



Experiment Title: _____

Section A — Experiment Identification

Field	Entry
Program Type	<input type="checkbox"/> Law of Entry <input type="checkbox"/> Dilution <input type="checkbox"/> Time-Series <input type="checkbox"/> <input type="checkbox"/> Atmosphere <input type="checkbox"/> Application <input type="checkbox"/> Substrate <input type="checkbox"/> Failure <input type="checkbox"/> <input type="checkbox"/> Edge <input type="checkbox"/> Repeatability <input type="checkbox"/> Open
Date	_____
Contributor / Class Code	_____

Small type note: Not all fields are required. Record what is known.

Section B — Reactive Chemistry

Field	Entry
Reactive Substance (chemical name)	_____
Solution Type	<input type="checkbox"/> Aqueous <input type="checkbox"/> Other
Dilution / Concentration	_____

Section C — Substrate & Surface Condition

Field	Entry
Substrate Type	<input type="checkbox"/> RSE Paper <input type="checkbox"/> Other
Paper Batch / Source (if known)	_____
Surface Condition	<input type="checkbox"/> Dry <input type="checkbox"/> Pre-wet <input type="checkbox"/> Other
Surface Preparation Notes	_____

Section D — Application & Entry Method

Field	Entry
Method of Application	<input type="checkbox"/> Brush <input type="checkbox"/> Mist <input type="checkbox"/> Cascade <input type="checkbox"/> Submersion <input type="checkbox"/> Other
Estimated Volume	<input type="checkbox"/> Drops <input type="checkbox"/> mL <input type="checkbox"/> Light <input type="checkbox"/> Heavy
Application Speed / Notes	_____

Reactive Patinas™ — RSE Program

Not everything needs to be explained. Some things only need to be observed — together.



Section E — Environment

Field	Entry
Ambient Temperature	_____ °C / °F
Ambient Humidity	_____ % / <input type="checkbox"/> Low <input type="checkbox"/> Med <input type="checkbox"/> High
Drying Condition	<input type="checkbox"/> Open Air <input type="checkbox"/> Boxed <input type="checkbox"/> Covered <input type="checkbox"/> Forced

Entry determines reaction. Everything above describes what was allowed to enter.

OBSERVATION & INTERPRETATION

(What happened, when, and how it was perceived)

This page privileges **language and attention**, not correctness.

Section F — Time & Change

Field	Entry
Time to First Visible Change	<input type="checkbox"/> Seconds <input type="checkbox"/> Minutes <input type="checkbox"/> Hours <input type="checkbox"/> Unknown
Total Observation Duration	_____

Section G — Visual Outcome (Descriptive, Not Evaluative)

Color Description (words, not codes):

Pattern / Behavior Observed:

- Bloom
- Migration
- Edge Darkening
- Collapse
- Uniform
- Other: _____

Uniformity:

- Even Uneven Localized

Section H — Unexpected or Partial Outcomes

No

Yes → Describe:

Unexpected results are valid data.



Section I — Images (Uploaded Separately)

Field	Entry
Image Type	<input type="checkbox"/> Still <input type="checkbox"/> Time Series
Image Timing	<input type="checkbox"/> Immediate <input type="checkbox"/> Delayed <input type="checkbox"/> Multiple
Notes on Images	_____

Section J — Confidence & Uncertainty

Field Confidence in Recorded	Entry
Data Known Unknowns /	<input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low
Estimates	_____

Section K — Open Notes & Questions