STEAM in Education

SCIENCE ON STAGE TURKU 2024

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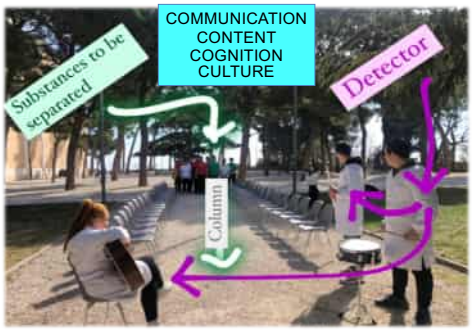
Chromatography Embodiment

A CLIL approach to outdoor learning and outreach



Watch the outdoor video!

WHY?

- Embodiment of molecular interactions makes real difficult theoretical models
- Informal learning and videomaking increase students' cooperative involvement in this gamification activity and in outreach
- Mathematical reworking of the recorded data improves students' performance (theory and practice with real samples via GCMS, UPLC-MS)

Color	N°	Sitting time (s)	Retention Time	Detector Note (louder for >amount)
White	3	3	1'1"	Do
Blu	4	8	1'40"	Mi
Red	5	15	2'13"	Sol
Pink	6	20	3'14"	Do 8va

Decrease T in GC

Increase eluent polarity in RP-HPLC

Increase pH in Cationic IC

Decrease pH in Anionic IC

Color	N°	Sitting time (s)	Retention Time	Detector Note (louder for >amount)
White	3	6	1'18"	Do
Blu	4	16	2'12"	Mi
Red	5	30	3'57"	Sol
Pink	6	40	4'51"	Do 8va

Students realize that
- time spent in the mobile phase is the same for all embodied substances
- separation results from different times spent in the stationary phase
- retention depends on experimental parameters

Chromatography? Tell me how you walk, and I'll tell you who you are!

Students (molecules) cross the same space and are separated due to their different **average** speeds, which depend on the different dwell times on stationary phase sites (different affinities)

STEAM Outreach

3 On Stage Performances
3 Science Festivals
1 Podcast
London Exhibition Dante 700

The emotional energy of this edutainment approach helps engage imagination, reflect on practice, cooperate, rationalize the chemical theory, and prevent misconceptions. Drama Science is a highly eligible CLIL activity.