

# Teachers' Intersection of Computational Thinking and Data Practices to Support Student Data Analysis during Science Investigations

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## RESEARCH QUESTIONS

1. In what ways do high school teachers integrate CT and data practices in their lesson plans during science investigations?
2. What are the most frequent intersections of data practices and CT in teacher lesson plans in relationship to teacher PD learning?

## RESEARCH DESIGN

Multiple case study design (Yin, 2003) was used to examine teacher background on CT knowledge, the design of CT supports in lesson plans, and the outcomes of CT supports implementation in the lessons. Data sources included pre/post test of teacher CT knowledge and document analysis of lesson plans and student work products.

## FINDINGS

**Earth Science:** There are low occurrences of creating and collecting because of the frequent use of secondary data. There are high occurrences of analyzing and abstraction due to the visual nature of Earth Science data.

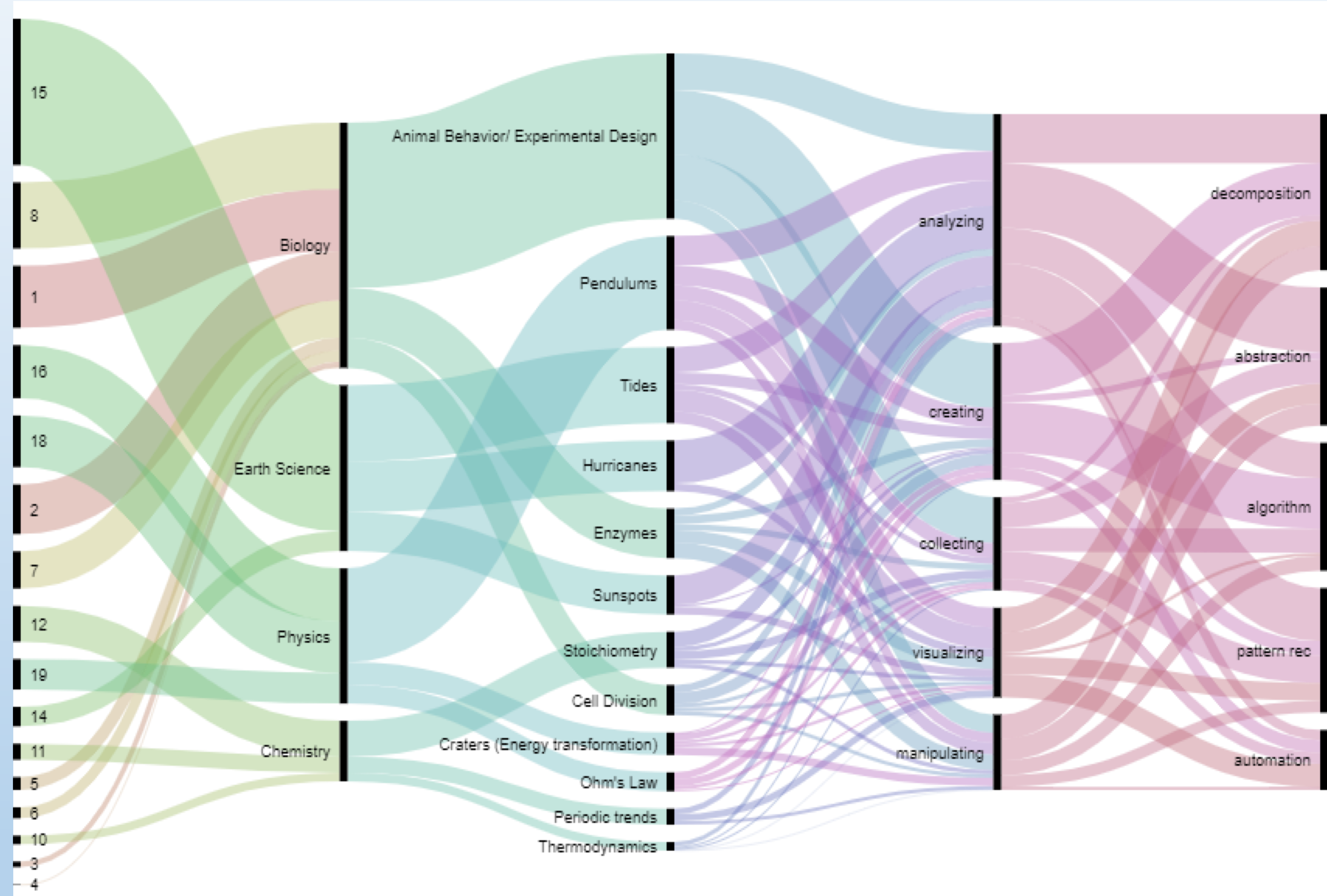
**Biology:** Overall, lessons showed an even distribution across all five data practices and all five CT practices, however, most opportunities originated in Animal Behavior which is an experimental design lesson.

**Chemistry:** With so few occurrences of either data practices or CT practices in the lesson plans, there appears to be a lot of opportunities to integrate.

**Physics:** Similar to biology, physics integrated the most CT and data practices in Pendulums which is also an experimental design lesson.

## DISCUSSION

Higher scoring learners tended to put more data practices and computational thinking practices in their lesson plans. Analyzing data was used most compared to other data practices. Automation was used least compared to other CT practices. Although most content areas did not use all five data practices and all five computational thinking practices, across the lesson plans, all practices were represented.



**Connections between PD participant content learning, subject matter, lesson, data practice, and computational thinking practice**

- Number on left indicates participant ID
- Highest score or frequency occurrence orients to the top
- Thickness of line represents greater quantity
- Color distribution is for the purpose of visual distinction only



This work is funded by the National Science Foundation (DRL-1842090). Any opinions, findings, conclusions, or recommendations are those of the authors and do not necessarily reflect the position or policy of endorsement of the funding agency.

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