A Taste of IBL (Inquiry-Based Learning)

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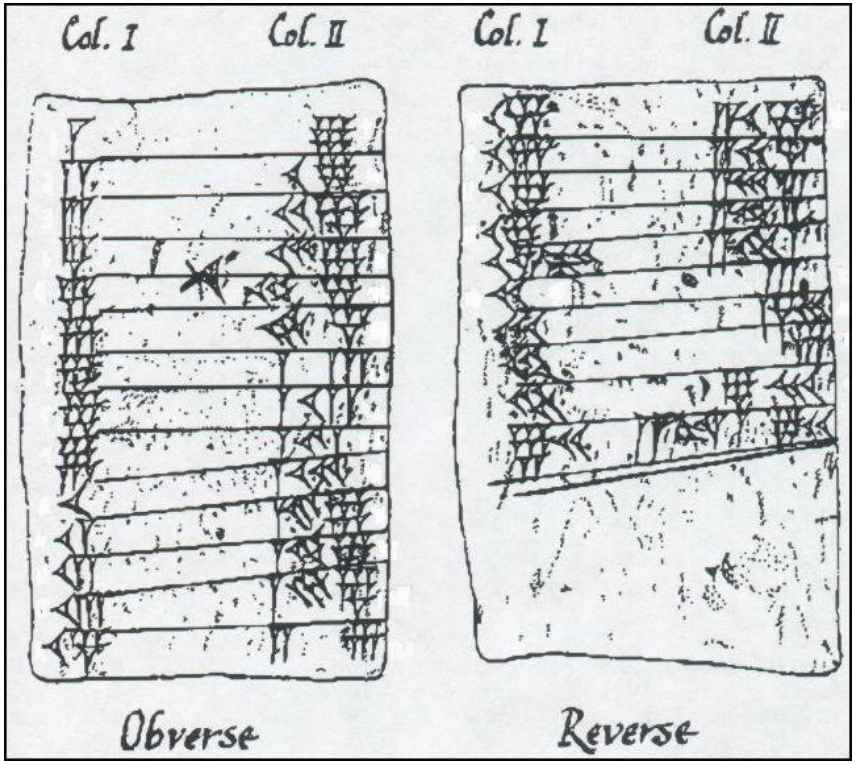
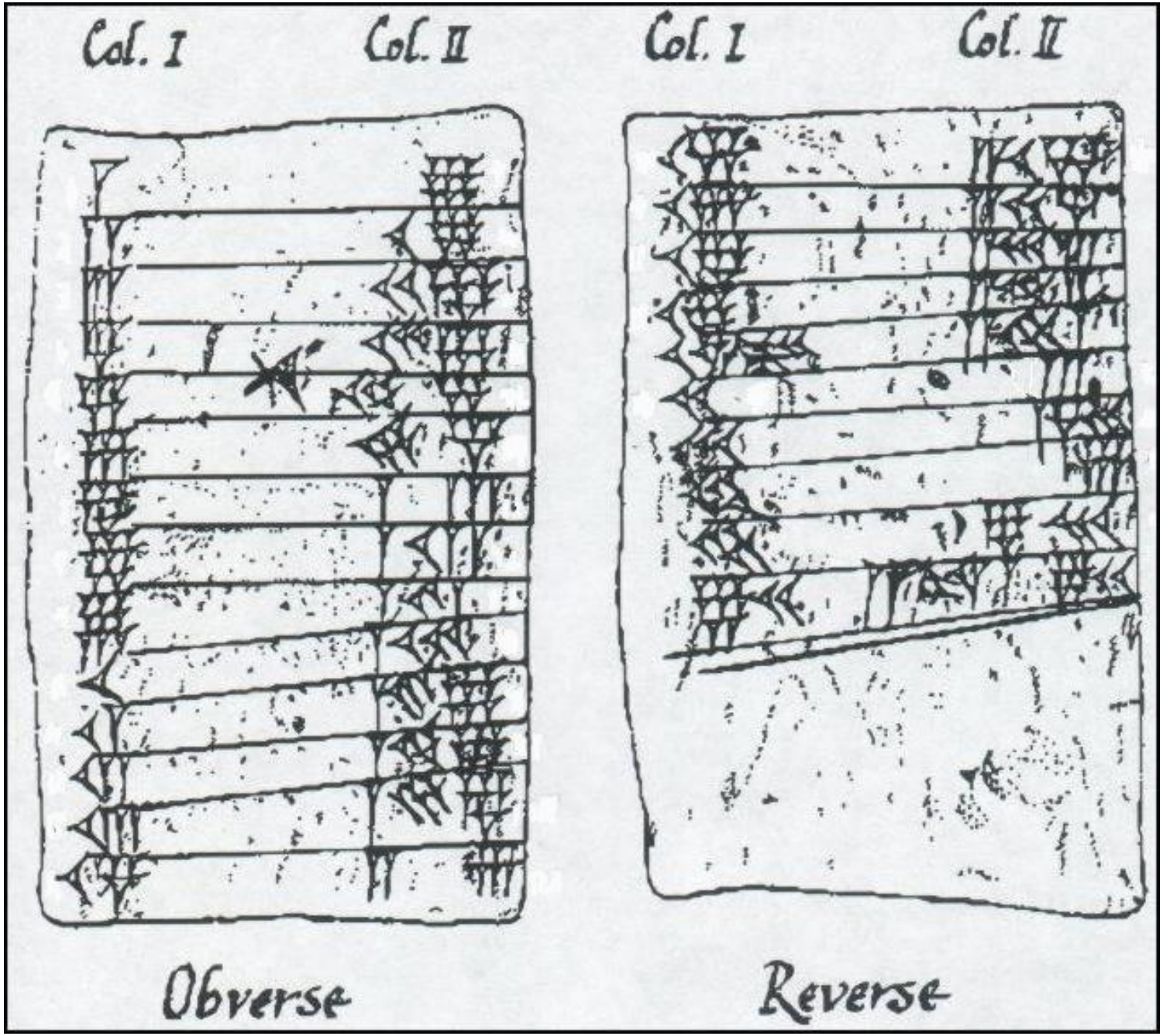
Outline

- Group Activity in Breakout rooms
- Brief introduction to IBL
- IBL resources
- Video of an IBL classroom
- Discussion

Group Activity (about 10 minutes)

- With your group, try to make sense of the ancient Babylonian Tablet. Make note of any conclusions you come to, and also any questions that come up for your group that you aren't able to answer.

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Obverse
Reverse

Inquiry Based Learning

- Active engagement with meaningful problems
- Communication, discussion, and presentation
- Systematic formative assessment and feedback
- Equitable instructional practices

The IBL community hopes to have a “big tent” for many teaching styles and methods

Aspects of IBL

- “From problems to explanations,
  not from examples to practicing”
  - Genuine problems worthy of student effort
  - Focus on explanation, understanding, communication

- “From telling to supporting and scaffolding”
  - Encourage students to take authority for evaluating their work and fellow students’ work

(From PRIMAS)

Four Pillars (Laursen & Rasmussen, 2019)

- Students engage in meaningful mathematics
- Students collaborate for sense-making
- Instructors inquire into student thinking
- Instructors foster equity in their instructional choices

Why IBL? (Laursen and Rasmussen 2019)

Instructors decide to use IBL methods for many reasons.

- A growing body of research shows IBL is as, or more, effective than "traditional" methods.
- Additional learning goals achieved by IBL: communication, problem solving, persistence, student authority.
- Ability to observe student thought processes directly - awareness of what students do and do not know
- Contribution of IBL methods to a more equitable classroom.
- Ability to interact *with* students at their level, instead of simply talking *to* them.

IBL methods

There is no single “IBL method.” IBL is a “Big Tent.” You may already be doing some IBL teaching without calling it that.

IBL instruction includes a variety of methods.

The choice of method depends on instructor, institution, course, and student body.

Many resources are available for new and experienced instructors.

Examples of IBL methods

- Think, pair, share
- Group problem solving
- Flipped classrooms
- Problem sets and presentations
  - Theorem sequences
- Guided inquiry (today's example)

IBL Resources

- **COMMIT Network** (Communities for Mathematics Inquiry in Teaching) regional support networks for IBL teaching (https://www.comathinquiry.org/)
- **Journal of Inquiry Based Learning in Mathematics** (jiblm.org/)- free, classroom-tested IBL course notes for many courses
- **Academy of Inquiry Based Learning** - workshops, links to other resources (inquirybasedlearning.org)
- **MAA IBL SIGMAA seminar series**
- **PRIMUS** (Problems, Resources, and Issues in Mathematics Undergraduate Studies)- journal includes many papers on IBL
- **Discovering the Art of Mathematics** - focused on IBL in liberal arts mathematics classes - artofmathematics.org/

References

Laursen, Sandra L. & Rasmussen, Chris (2019). I on the Prize: Inquiry Approaches in Undergraduate Mathematics, *International Journal of Research in Undergraduate Mathematics Education*, 5(1), 129–146

PRIMAS project (2013). “Inquiry-based learning in maths and science classes”. www.primas-project.eu. ISBN: 978-3-00-043851-6

Questions?

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