SURGE

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scaffolding integration
of intuitive and formal understanding
within and around games

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WHERE DISCOVERIES BEGIN
FILAMENT GAMES
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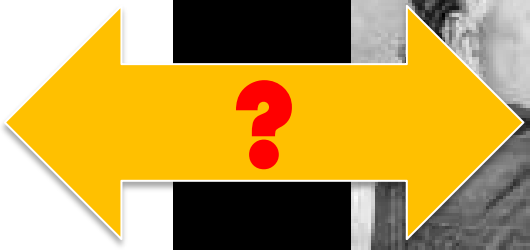
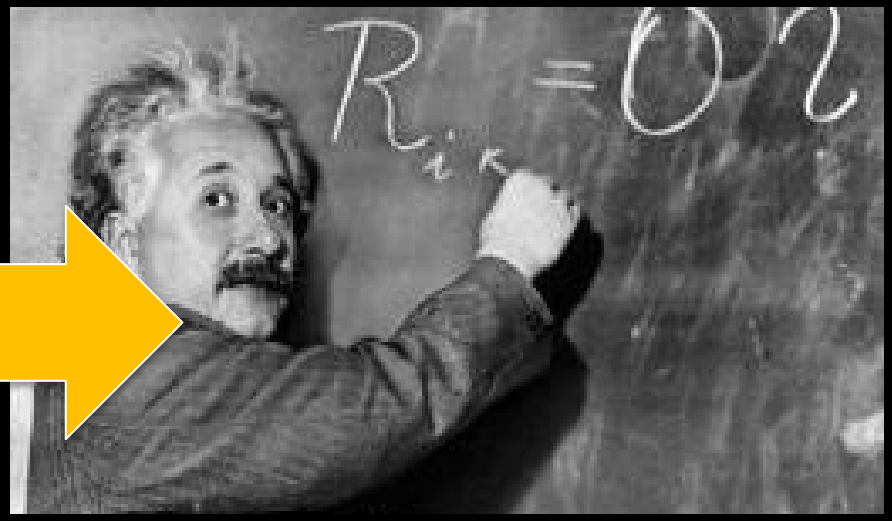
how can games more effectively bridge intuitive and formal understandings?





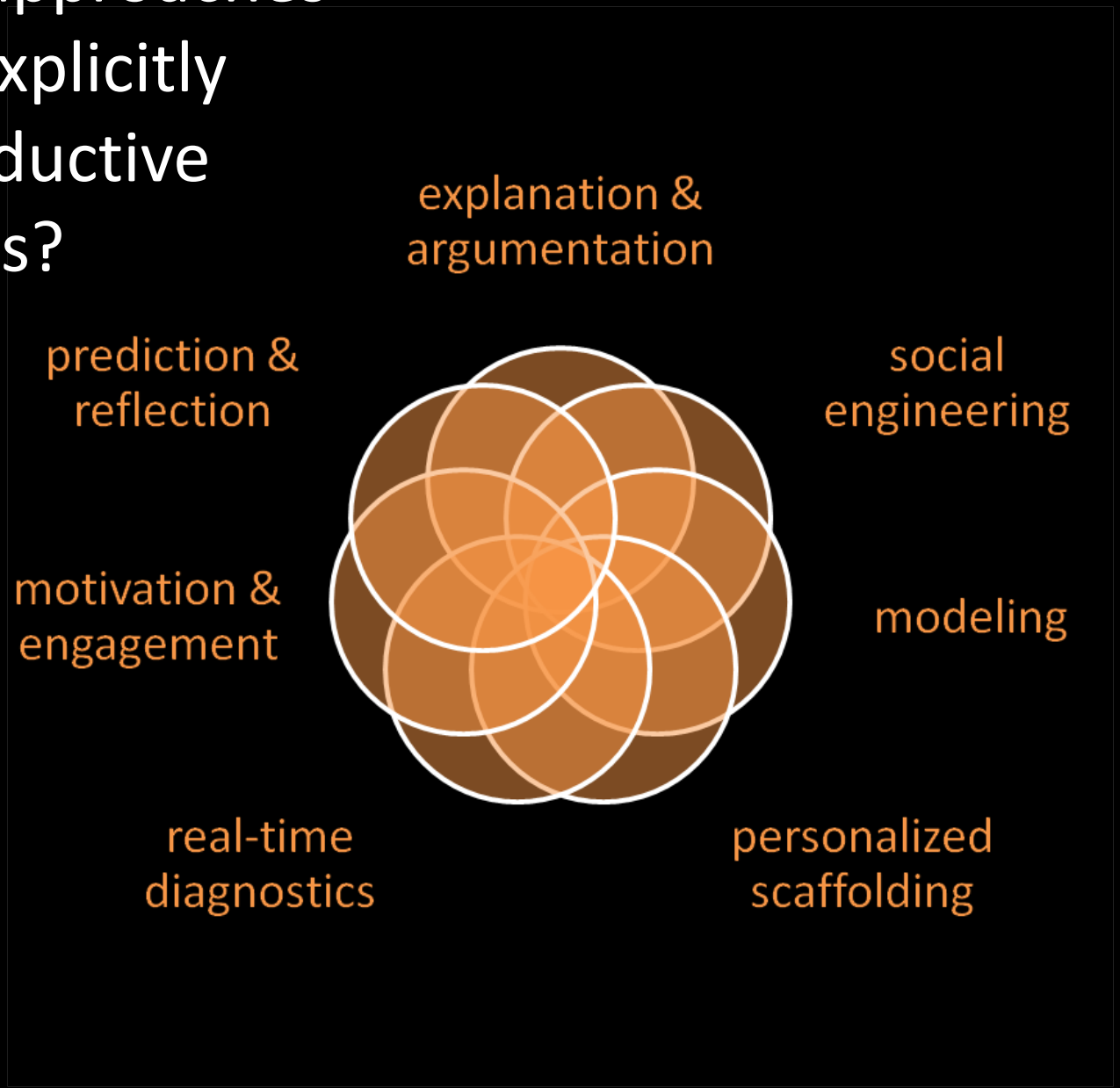
Vygotsky's "spontaneous" and "scientific" concepts

students build important intuitive understandings playing games but they generally don't make formal connections unscaffolded

- ✓ current learning = predictive mode of thinking about force and motion.
- ✓ players become better at making if/then predictions in terms of the consequences of different actions.

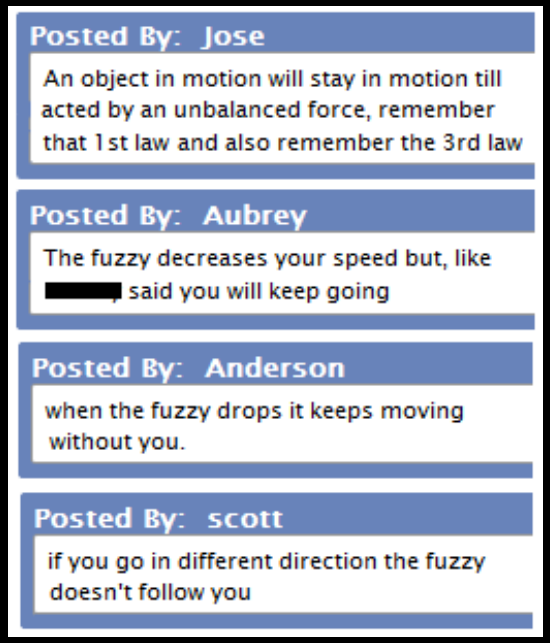
students need support for explicit articulation of intuitive understandings

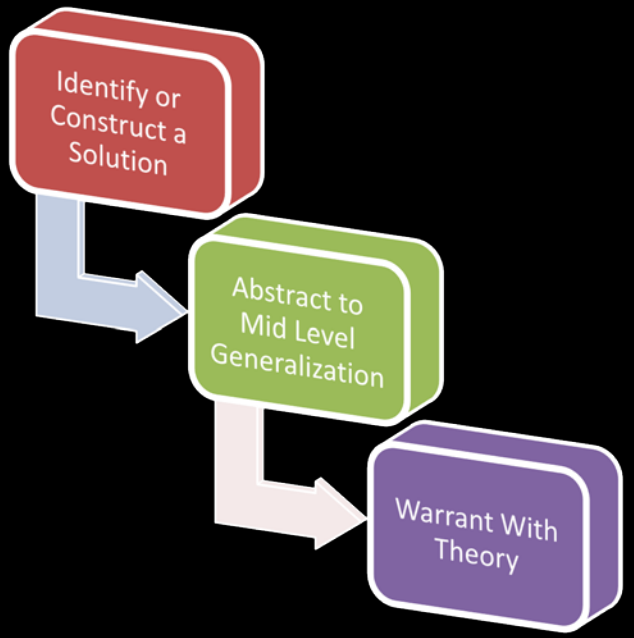
What design approaches help players explicitly articulate productive mental models?



Scaffolding Explicit Articulation of Intuitive Understanding

- restructuring player navigation in the game
- engaging students in online communities outside of the game
- engaging students in game dialog with NPCs





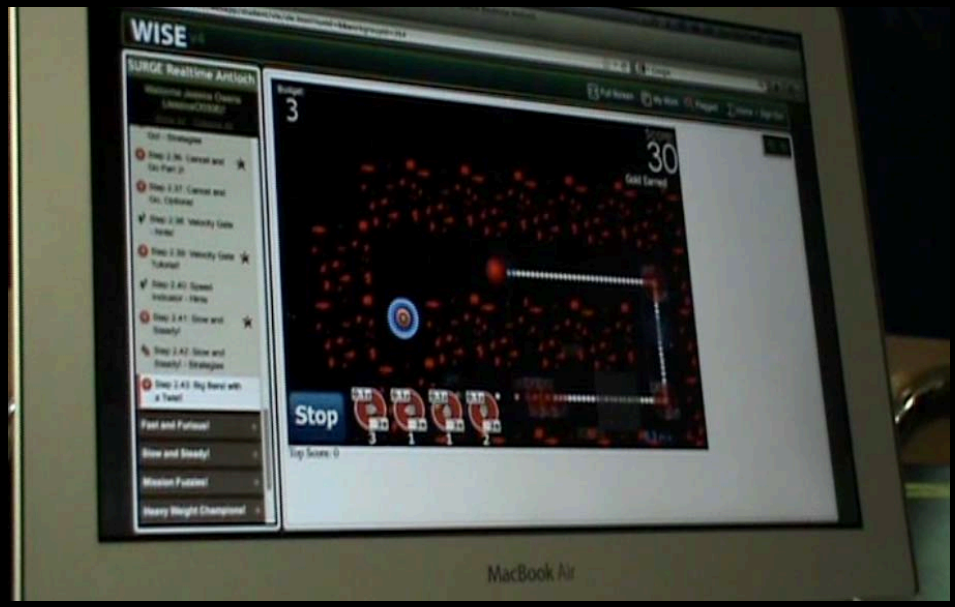
Assessment of Collaborative Learning through Multiple-Measures Analysis

- How does informal collaboration outside a game affect learning outcomes?
- How can we assess process data from game play to examine the effects of collaboration?
- How might we leverage informal collaborations in classroom settings?

Students Epistemological Framing in Digital Gaming Environments

- What kinds of expectations and epistemological frames do students exhibit prior to gameplay and during gameplay?

- How can we design environments to generate more productive frames?

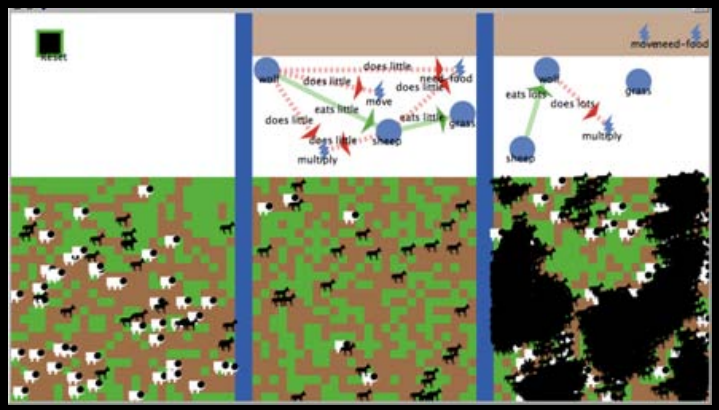


Teacher Cognition and Non-Canonical Representations of Physics

- How do teachers reason about non-canonical physics representations?
- What instructional and curriculum supports do teachers need to successfully adopt EGAME into their classrooms?

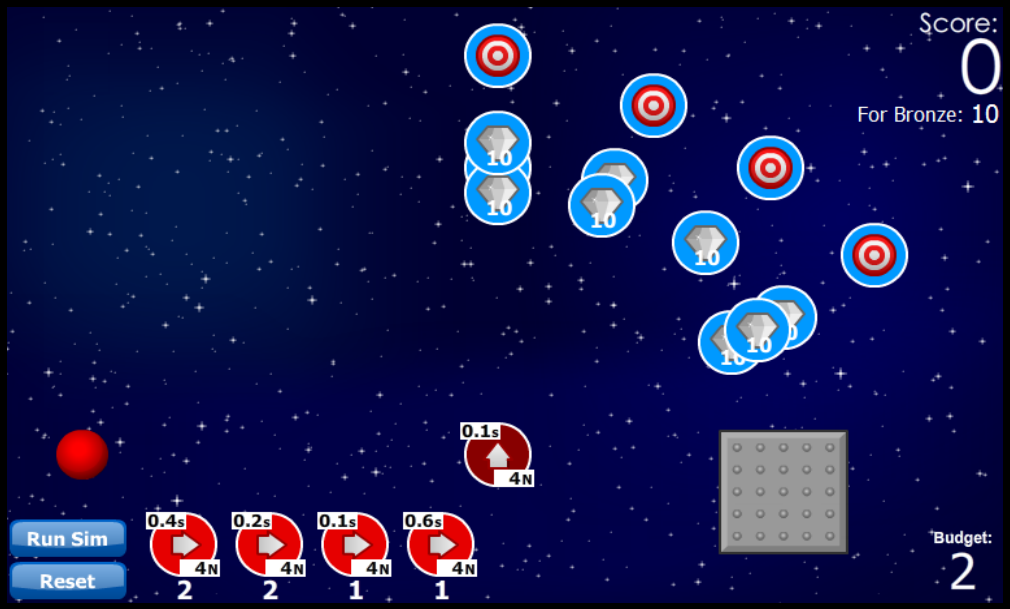
Integrating Modeling with Game Play

- How can event-based representations of kinematic phenomena be leveraged for explicit mathematization as modeling-based learning activities during game play?
- How can game play support the development of a modeling-based epistemology in physics?



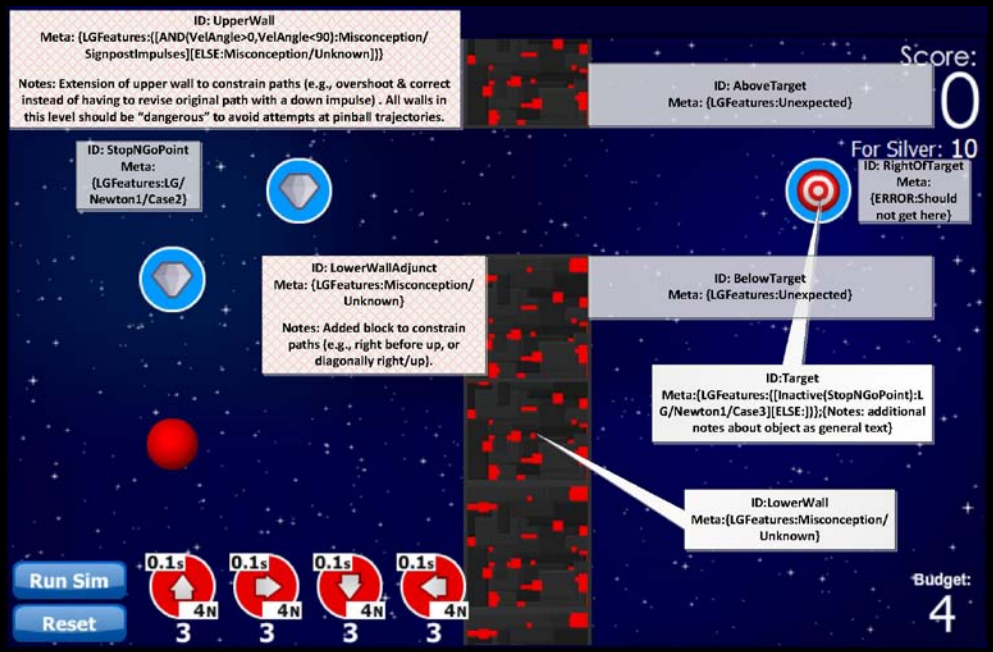
Applying Psychological Research to Refine Game Elements

- How can applications of basic research in visual cognition, embodied cognition, and educational psychology improve the effectiveness of SURGE as a learning game?



Educational Data Mining for Game-Play Data

- How can important learning behaviors be efficiently and autonomously identified in sequences of student game play data that include a variety of features for each item



thank you!

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