LESSONS IN VIDEO GAME LOGFILE ANALYSES

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NOOBS VS. LEETS

- **Designed to teach middle school students basic geometry concepts**
  - Acute, Obtuse, Straight, & Right angles
  - Supplementary angles
  - Complementary angles
  - Vertical angles
  - Triangle rule
 - Quadrilateral rule

TRIANGLE RULE

SUPPLEMENTARY ANGLES
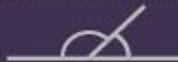
COMPLEMENTARY ANGLES

VERTICAL ANGLE RULE

90°

45°

90°

90°

90°
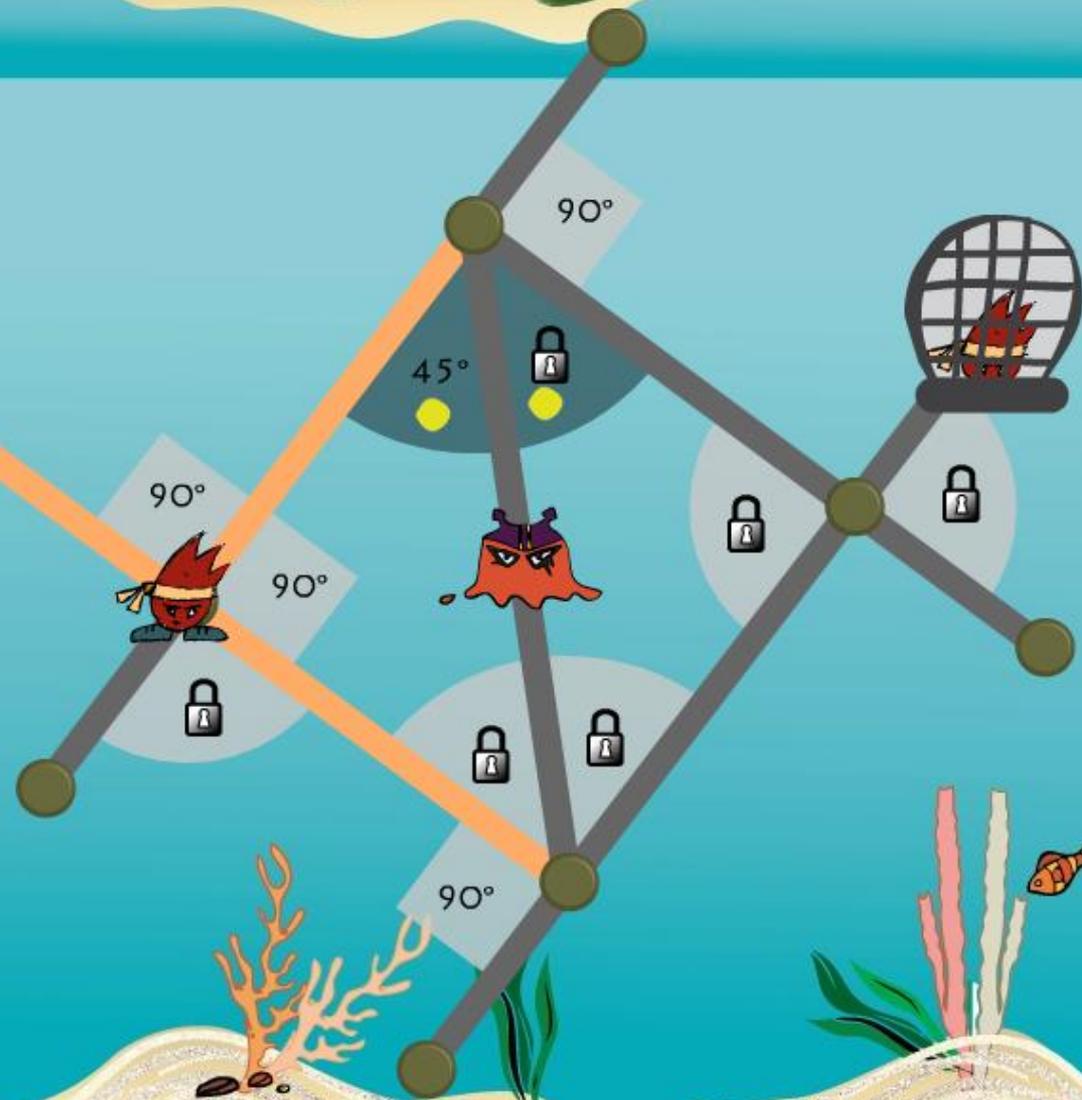
RESEARCH DESIGN

- **Game structure**
  - 6 Chapters, 7-8 levels per chapter
  - Each chapter introduces a new Geometry concept
  - Levels designed to scaffold students' acquisition and understanding of each new concept

- **2 game versions**
  - Rule/Conceptual
  - Number/Arithmetic

- **Research Question:** What are the differences in learning between a conceptual and arithmetic approach to learning geometry?

GOALS

- Learn functionality and explore potential uses of DataShop

- Process video game logfile data into interpretable form
  - What types of meta data should logfiles record for EDM purposes?

- Import into DataShop

- Use learning curve models and other tools to explore the data

LEVEL DESIGN

ANGLE_EBD = 35°

ANGLE_BDC = 75°

ANGLE_CHD = 35°
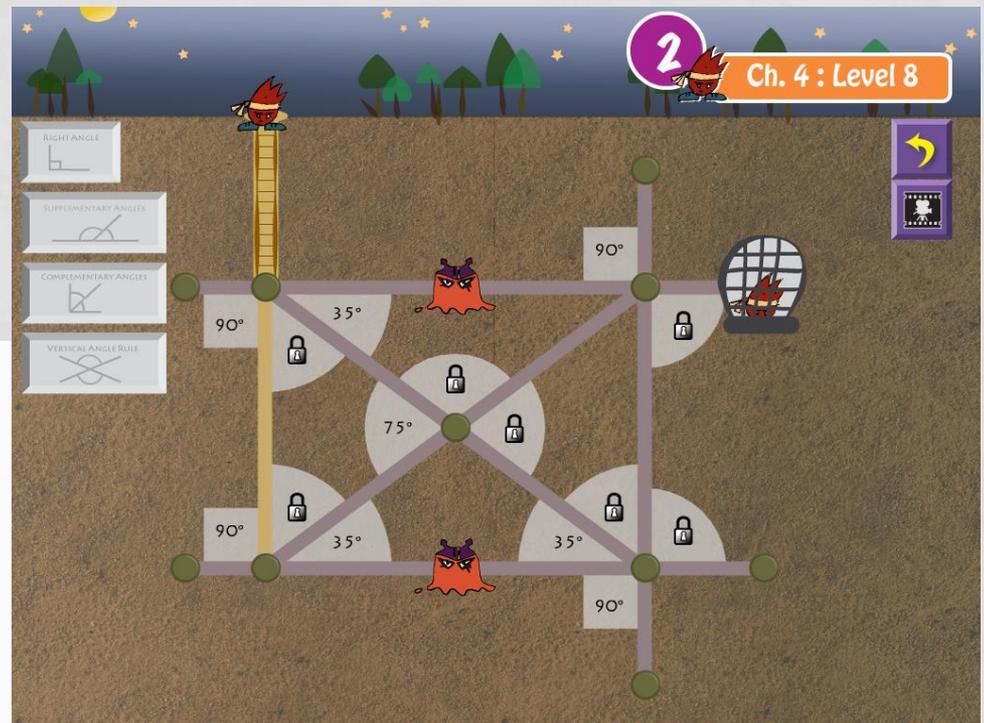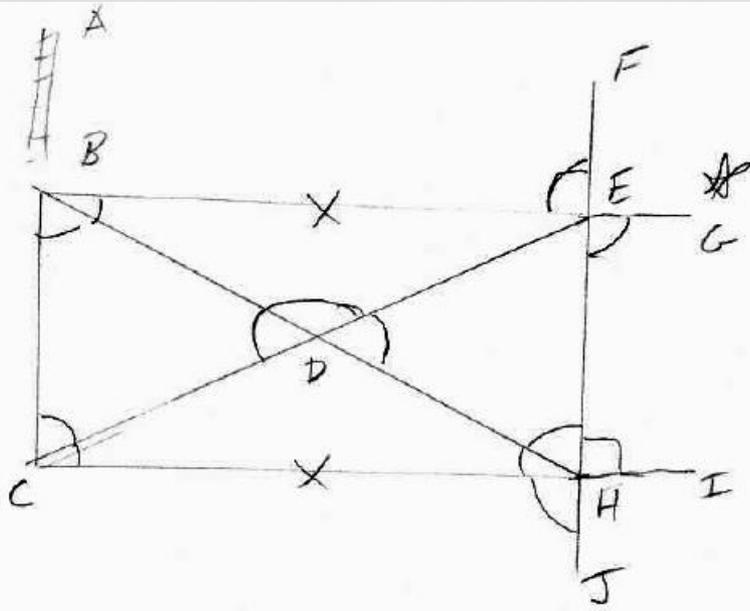
LOGFILE STRUCTURE

Columns	Definitions
id	Unique identifier for each row of table
game	String identifying the game name & version #
treatment	"Rule" or "Arithmetic"
userid	The user's assigned ID
username	The user's name
timestamp	The date/time the rows were entered into the table
location	Chapter/level or screenname where event took place
who	Entity that issued the event (ie: ANGLE_EDF, straight_button)
what	Content of message (ie: Selected, Correct, Wrong)
extra	Additional recorded values

LOGFILE EXAMPLES

Angle Selected
Each time the user clicks a deselected angle, this message is sent. It includes the "name" of the angle. For example:
For example:

| 11 | QUADRILATERAL_V0.1 | RULES | CRNS | Ruth | 2010-11-22 07:11:56 | Chapter 1, Level 1 | ANGLE_DCB | SELECTED BY USER | NULL | 42542 |

Angle Deselected
Each time the user clicks a selected angle and deselects it, this message is sent. This also includes the name of the angle. For example:

| 224 | QUADRILATERAL_V0.1 | RULES | CRNS2 | rns2 | 2010-11-22 07:29:17 | Chapter 1, Level 9 | ANGLE_CDE | DESELECTED BY USER | NULL | 467804 |

Rule Button Clicked
Each time a rule button is clicked we record a message with the name of the rule as follows. For example:

| 215 | QUADRILATERAL_V0.1 | RULES | CRNS2 | rns2 | 2010-11-22 07:28:33 | Chapter 1, Level 8 | straight_button | CLICKED | NULL | 423595 |

Rule Applied Successfully
Each time a rule is applied successfully, we send a message saying the name of the rule. For example:

| 214 | QUADRILATERAL_V0.1 | RULES | CRNS2 | rns2 | 2010-11-22 07:28:33 | Chapter 1, Level 8 | straight_button | CORRECT | NULL | 423590 |

Number Button Applied Successfully
Each time a number button is applied successfully, we send a message saying the name of the number button. For example:

| 206 | QUADRILATERAL_V0.1 | RULES | CRNS2 | rns2 | 2010-11-22 07:27:51 | Chapter 1, Level 7 | number_button_90 | CORRECT | NULL | 381494 |

LOGFILE LESSONS LEARNED

- **Create specific game state information**
  - When player makes a choice in game, what elements are selected?
    - Is that selection right or wrong?

  - If levels are set, diagram out possible solution/distractor paths through each level

  - Record relevant summary statistics

- **Test logfile configuration for ability to address potential research questions before starting study**
  - Not just what information you need, but what format do you need it in?

DESIGN LESSONS LEARNED

- **Level Design**
  - Map out which elements need to be solved in order to complete the level and which ones are unnecessary or distractors

  - List which steps/actions in game are unproductive/lead to player death

  - Create consistent labeling system

- **Document all design changes in your development process**
  - Level structure changes

  - Clearly define answer values