

ST Math Data Dictionary

Introduction

This document provides an example of how ST Math data are documented through a data dictionary. It illustrates a consistent approach for describing variables included in research studies, program evaluations, and data-sharing efforts.

Because every study has different research questions, data requirements, and reporting needs, the variables included in an ST Math data dictionary will vary by project. Consequently, the fields and examples presented here are intended to serve as a template rather than a comprehensive or fixed specification.

For each variable, a data dictionary typically includes information such as the variable name, data type, a clear description of its meaning, allowable values or coding scheme, and any additional notes that support correct interpretation. Depending on the study, different and/or additional metadata—such as the level of aggregation, derivation method, or source table—may also be included.

The goal of a data dictionary is to establish a shared understanding of the data, promote consistency across analyses, and facilitate transparent collaboration among researchers, educators, and technical teams.

Sample Data Dictionary

Session and Higher-Level Information

Variable Name	Data Type	Example	Description
user_gid	UUID	000d009e-c289-4d68-9880-5661a3c4f2a2	Unique ST Math user id for learner or staff accounts across school years
session_gid	UUID	5d250ed9-97b9-4ba2-bea0-ecdd6a588e0f	Unique session id
session_start_time	POSIXct	9/2/25 18:08	Session start timestamp
session_end_time	POSIXct	9/2/25 18:14	Session end timestamp
session_duration	integer	360	Seconds since logged in
event_type	string	NavigationEvent	Type of event recorded: Navigation - when students navigate from one page to another ToolUse - when students click or drag on any tools Grade - quiz or puzzle attempt
event_time	POSIXct	9/2/25 18:09	Timestamp indicating when the event was submitted by the client application (e.g., when a puzzle attempt was submitted)
navigation__id	string	exam	Destination to which the student navigated
tooluse__interaction	string	click	Action: click or drag
tooluse__category	string	toolbar	Tool name
tooluse__objective	string	menu	Tool purpose

Objective Information

Variable Name	Data Type	Example	Description
objective_gid	UUID	f21da0f6-a997-45cd-9041-96d4d2e702c4	Identifier for an objective. The same objective_gid may refer to different versions of the objective across school years or curricula
objective_id	integer	1399	Integer identifier for the objective. Serves the same purpose as objective_gid and is not unique across school years or curricula
objective_name	string	Recognizing Shape Attributes	Canonical name of the objective. Use objective_version_name to identify version_specific names across school years or curricula
objective_type	string	in-journey	Assignment type associated with the learning objective
objective_grade	integer	3	The syllabus grade of the objective
syllabus_state	string	Virginia	State specific or Common Core corresponding to curriculum
recommended_standards	string	3.N.4a	Math standard associated with the objective
related_standards	string	K.N.1b	Math standard related to the objective
total_levels	integer	15	Total number of game levels in the objective
max_completed_levels	integer	15	Number of levels within the objective that have been successfully completed
percent_complete	integer	1	Percentage of objective completed, calculated as max_completed_levels divided by total_levels
started_at	POSIXct	10/2/25 15:31	Objective start timestamp
finished_at	POSIXct	10/2/25 15:56	Objective end timestamp
last_played_at	POSIXct	10/2/25 15:31	Objective last played at timestamp

pre_quiz_correct	integer	3	Number of pre_quiz items answered correctly
pre_quiz_total	integer	5	Total number of question items in pre_quiz
pre_quiz_score	decimal	0.6	Pre-quiz score, calculated as pre_quiz_correct divided by pre_quiz_total. Expressed as proportion of correct responses
post_quiz_correct	integer	3	Number of post_quiz items answered correctly
post_quiz_total	integer	5	Total number of question items in post_quiz
post_quiz_score	decimal	0.6	Post-quiz score, calculated as post_quiz_correct divided by post_quiz_total. Expressed as proportion of correct responses

Level Information

Variable Name	Data Type	Example	Description
level_gid	UUID	18a16bc4-5921-40a0-8853-fad566314271	Identifier for a level. The same level_gid may refer to different versions of the objective across school years or curricula
level_name	integer	1	Level number within the game
game_name	string	Temperature Changes	Canonical name of the ST Math game
game_id	integer	12994	Unique integer identifier of the game
max_completed_puzzles	integer	8	Number of puzzles completed in the level
total_puzzles	integer	8	Total number of puzzles in the level
successful_attempts	integer	1	Number of successful attempts
failed_attempts	integer	9	Number of unsuccessful attempts before the first level pass
additional_failed_attempts	integer	0	Number of additional unsuccessful attempts during replay
started_at	POSIXct	10/2/25 13:21	Level start timestamp
finished_at	POSIXct	10/2/25 13:23	Level end timestamp
last_played_at	POSIXct	10/2/25 13:21	Level last played at timestamp

Puzzle and Quiz Information

Variable Name	Data Type	Example	Description
gradeevent__experience_version_gid	UUID	58b95e55-faae-4d13-a93e-b6fb54e627d2	Experience version ID - current journey
gradeevent__objective_gid	UUID	f21da0f6-a997-45cd-9041-96d4d2e702c4	Objective ID - current objective
gradeevent__game_gid	UUID	337a8adb-22fa-44a9-88c4-ca39b2c04ebf	Game ID - current game
gradeevent__level_gid	UUID	18a16bc4-5921-40a0-8853-fad566314271	Level ID - current level
gradeevent__levels_in_game	integer	6	Number of levels in game
gradeevent__levels_in_objective	integer	17	Number of levels in objectives
gradeevent__type	string	puzzle	Assessment or puzzle data type
gradeevent__puzzle_index	integer	0	Zero-based index of the puzzle within the level
gradeevent__puzzles_in_level	integer	8	Number of puzzles in current level
gradeevent__puzzle_started_at	POSIXct	10/2/25 14:30	Timestamp indicating when the puzzle finished loading and the learner could begin attempting to solve it
gradeevent__feedback_animation_started_at	POSIXct	10/2/25 14:30	Feedback animation started timestamp
gradeevent__feedback_animation_ended_at	POSIXct	10/2/25 14:31	Feedback animation ended timestamp
gradeevent__puzzle_success	integer	1	Puzzle attempt success (1 = success; 0 = failed attempt)