MEASURE UP!

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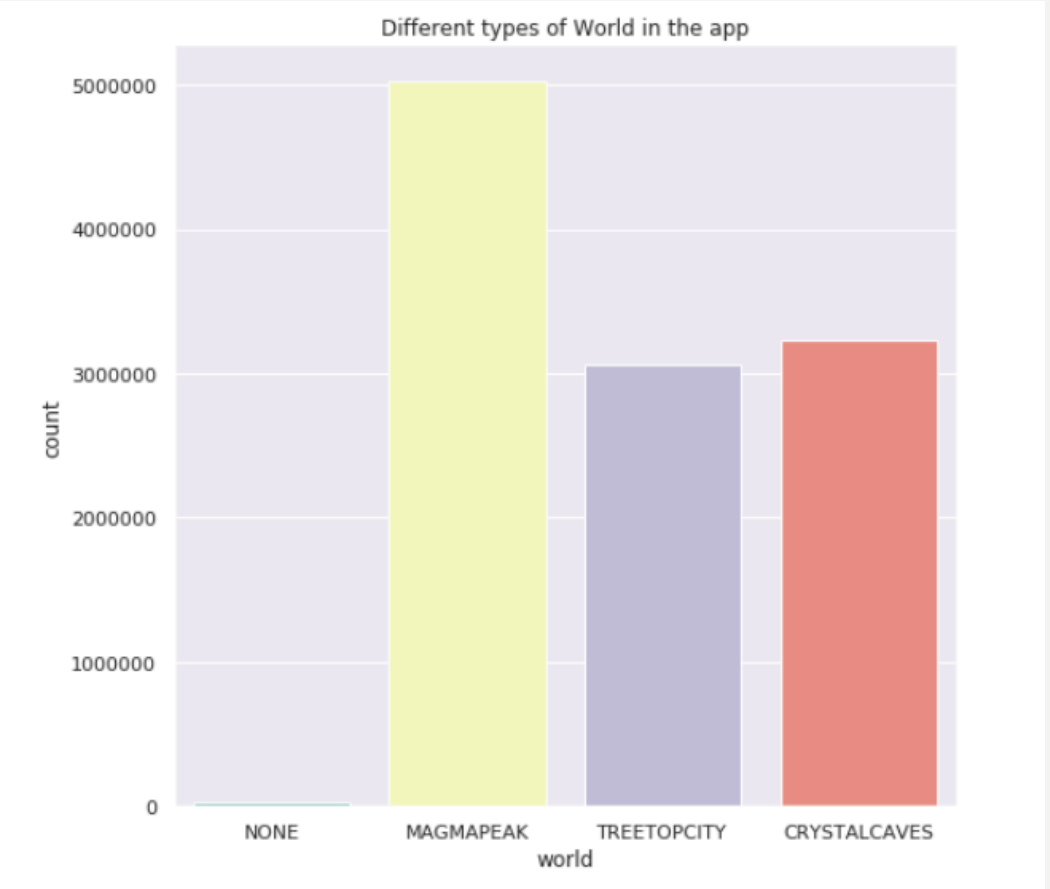
WHAT IS MEASURE UP?

- Educational application
- Children aged 3 to 5
- Learn early STEM concepts
  - Length
  - Capacity
  - Weight

while going on an adventure through different worlds

WHAT IS A WORLD?



- Three different worlds (sections in the app)
  - Magma Peak-Capacity
  - Tree Top City- Length
  - Crystal Caves- Weight

INSIDE THE WORLD

VIDEO

exposes the kid to a topic or a problem solving approach.

ACTIVITY

mini games that allow kids to practice their skills, do not have a defined goal.

GAMES

help kids practice their skills with the goal of solving a specific problem.

Includes progressively more challenging round.

ASSESSMENT

interactives that are designed specifically with the goal of measuring a player's knowledge of the subject matter

TREASURE MAP

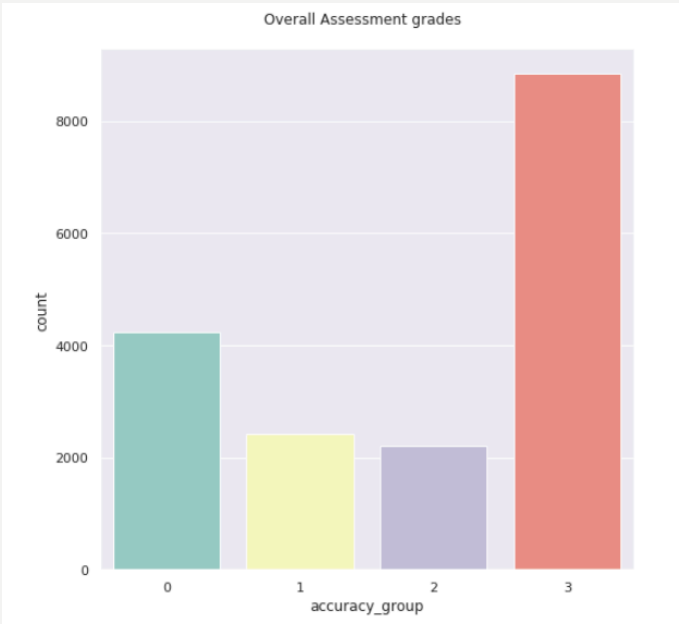
Different kinds of lessons inside a world

- **ACTIVITY – 3**
- **VIDEO – 1**
- **GAME – 4**
- **ASSESSMENT -1**

ACCURACY GROUP (GRADE)

There are 4 accuracy group

- 3: the assessment was solved on the first attempt
- 2: the assessment was solved on the second attempt
- 1: the assessment was solved after 3 or more attempts
- 0: the assessment was never solved



PROBLEM STATEMENT

Predict accuracy group(grade) for each player

Provide inferences that leads to better-designed games and improved learning outcomes

DATASET

	event_id	game_session	timestamp
0	27253bdc	45bb1e1b6b50c07b	2019-09-06T17:53:46.937Z
1	27253bdc	17eeb7f223665f53	2019-09-06T17:54:17.519Z
2	77261ab5	0848ef14a8dc6892	2019-09-06T17:54:56.302Z
3	b2dba42b	0848ef14a8dc6892	2019-09-06T17:54:56.387Z

GAMEPLAY DATASET

(11341042, 11)

	event_data	installation_id	event_count	event_code	game_time	title	type	world
	{"event_code": 2000, "event_count": 1}	0001e90f	1	2000	0	Welcome to Lost Lagoon!	Clip	NONE
	{"event_code": 2000, "event_count": 1}	0001e90f	1	2000	0	Magma Peak - Level 1	Clip	MAGMAPEAK
	{"version":"1.0","event_count":1,"game_time":0,"event_code":2000}	0001e90f	1	2000	0	Sandcastle Builder (Activity)	Activity	MAGMAPEAK
	fill up your mold with sand! You can use the shovel here. The mold gives the sand its :"audio","total_duration":6758,"event_count":2,"game_time":53,"event_code":3010}	0001e90f	2	3010	53	Sandcastle Builder (Activity)	Activity	MAGMAPEAK
	fill up your mold with sand! You can use the shovel here. The mold gives the sand its pe":"audio","duration":6919,"event_count":3,"game_time":6972,"event_code":3110}	0001e90f	3	3110	6972	Sandcastle Builder (Activity)	Activity	MAGMAPEAK

DATASET

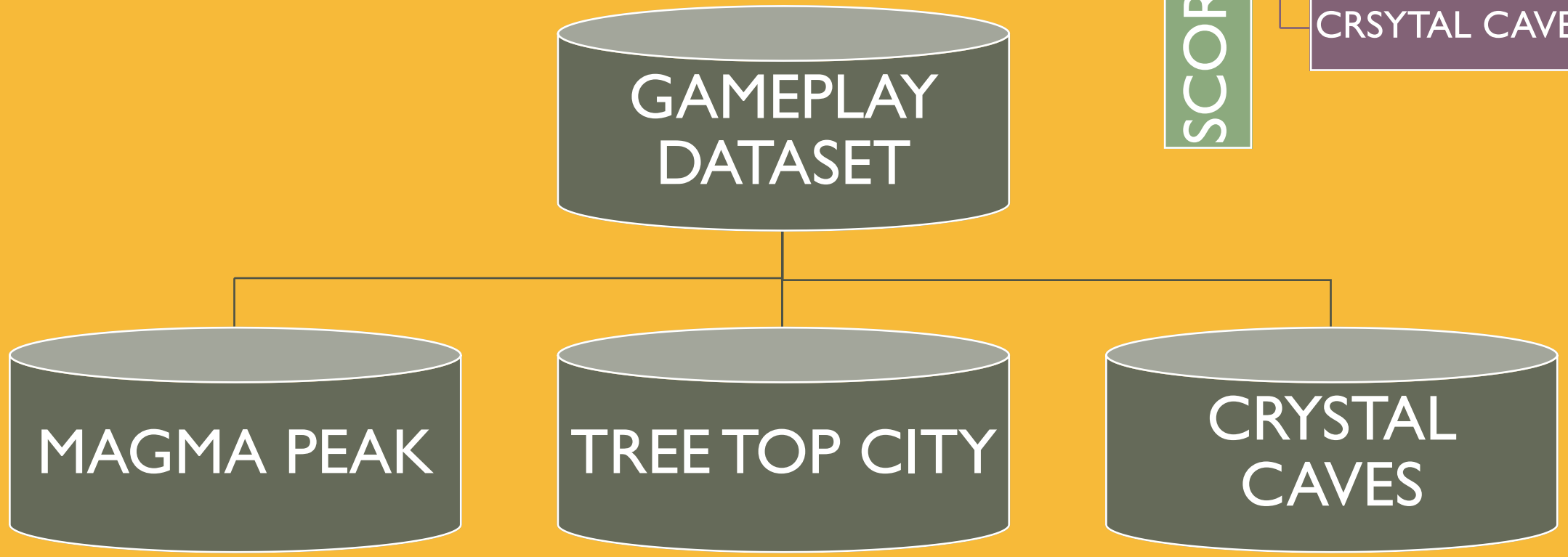
SCORE DATASET

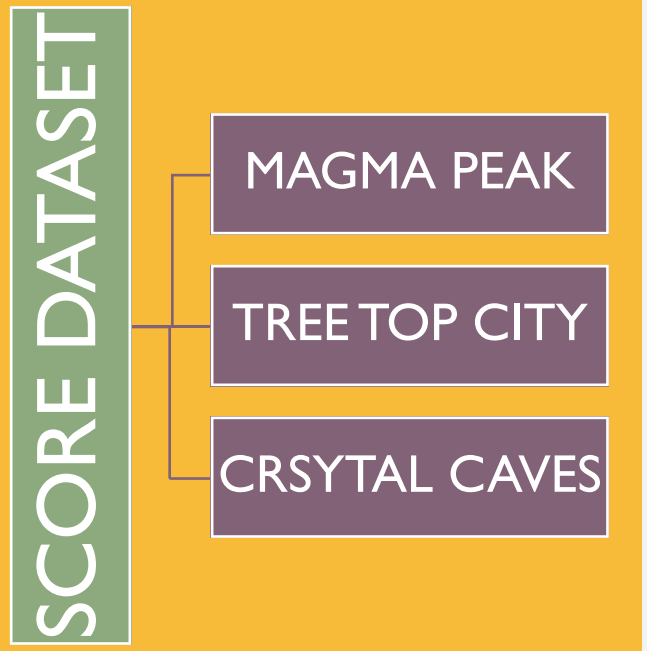
(17690, 7)

	game_session	installation_id	title	num_correct	num_incorrect	accuracy	accuracy_group
0	6bdf9623adc94d89	0006a69f	Mushroom Sorter (Assessment)	1	0	1.0	3
1	77b8ee947eb84b4e	0006a69f	Bird Measurer (Assessment)	0	11	0.0	0
2	901acc108f55a5a1	0006a69f	Mushroom Sorter (Assessment)	1	0	1.0	3
3	9501794defd84e4d	0006a69f	Mushroom Sorter (Assessment)	1	1	0.5	2
4	a9ef3ecb3d1acc6a	0006a69f	Bird Measurer (Assessment)	1	0	1.0	3

FEATURE EXTRACTION

Dividing the dataset into three parts based on three different worlds





FEATURE EXTRACTION

	installation_id	Bottle Filler (Activity)	Bubble Bath	Dino Dive	Dino Drink	Magma Peak - Level 1	Magma Peak - Level 2	Sandcastle Builder (Activity)	Scrub-A-Dub	Slop Problem	Watering Hole (Activity)	Cauldron Filler (Assessment)_t	accuracy_group
0	0006c192	6.600	1.61	2.53	0.00	2	2	1.887	2.71	0	0.36	0.24	3
1	002db7e3	8.240	4.32	4.03	3.49	2	3	0.717	2.51	0	1.57	0.57	3
2	003372b0	2.460	2.61	2.60	3.31	1	1	1.220	0.49	0	0.07	0.60	3
3	004c2091	1.197	0.00	0.00	0.00	1	2	0.000	0.00	0	0.12	0.30	3
4	00634433	0.000	0.00	0.00	0.00	1	1	0.000	0.00	0	0.00	1.13	3

Final dataset after feature extraction

MACHINE LEARNING MODELS – MULTICLASS CLASSIFICATION

CRYSTAL CAVES

Model	Score	Kappa Score
SVM	0.6574	0.6117
Random Forest	0.6740	0.6316

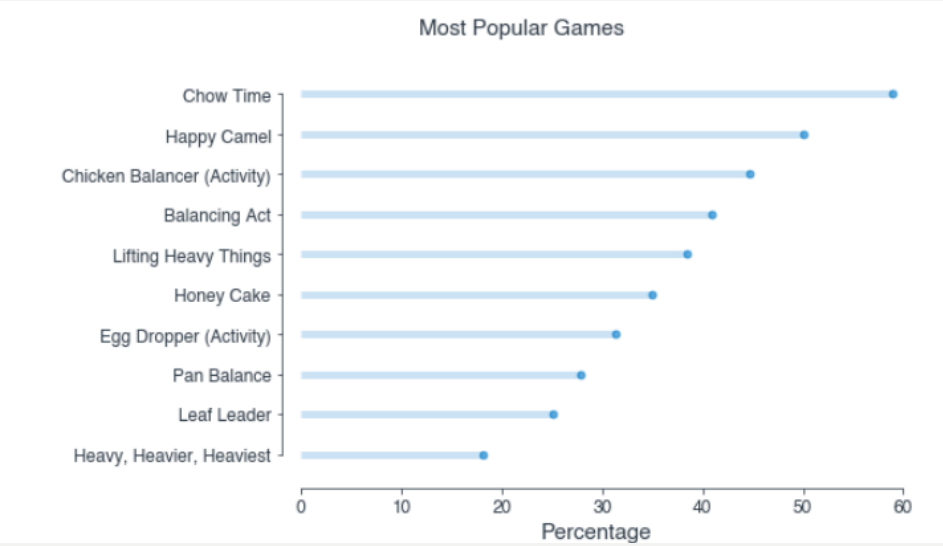
MAGMAPEAK

Model	Score	Kappa Score
SVM	0.64130	0.1007
Random Forest	0.625	0.2900

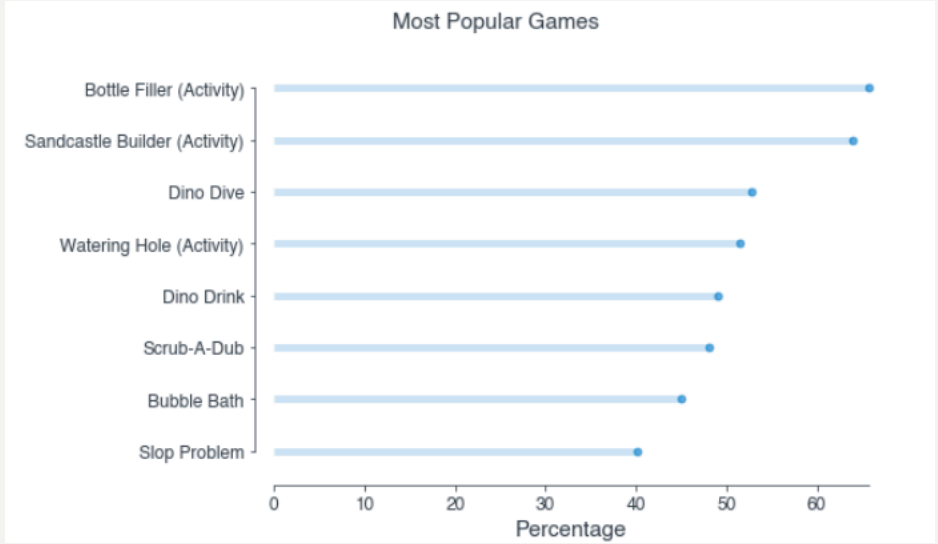
TREE TOP CITY

Model	Score	Kappa Score
SVM	0.5992	0.4981
Random Forest	0.6329	0.5582

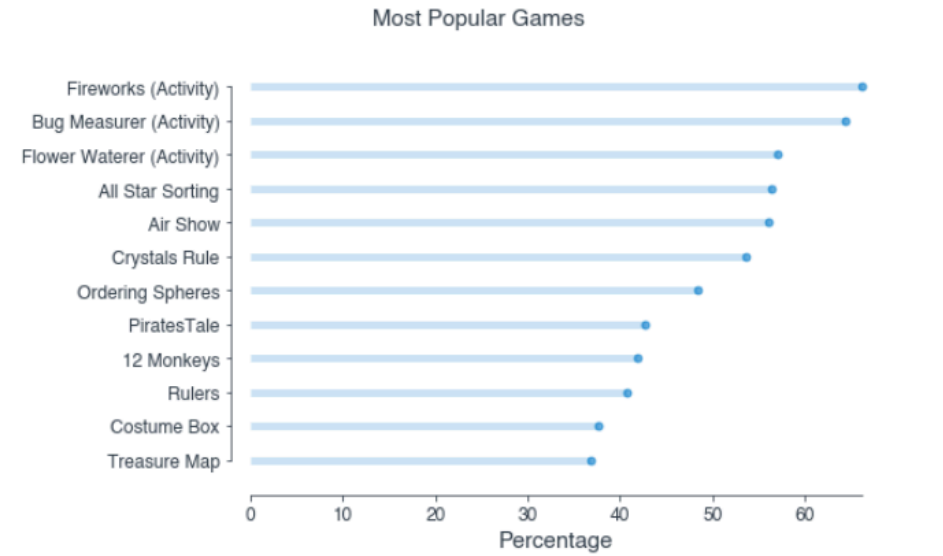
MOST POPULAR LESSONS



CRYSTAL CAVES

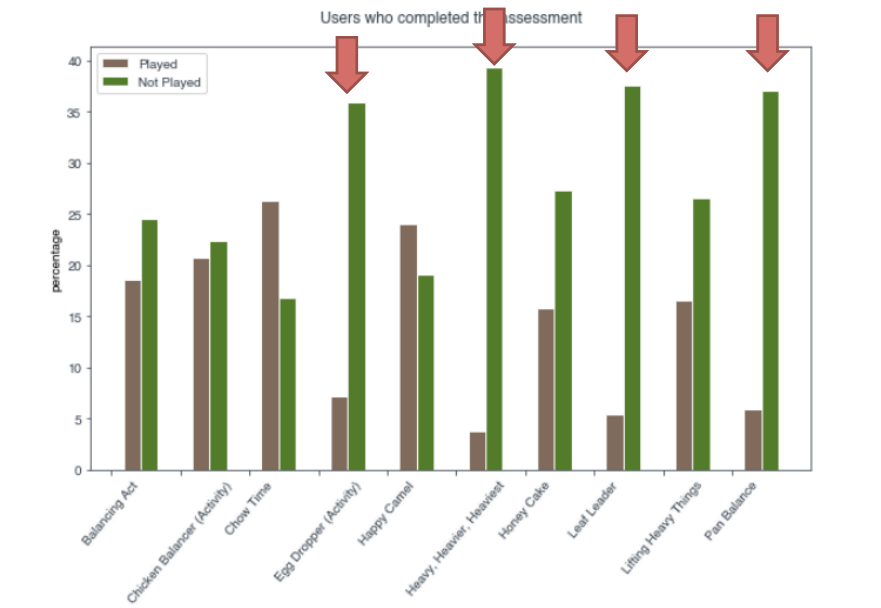


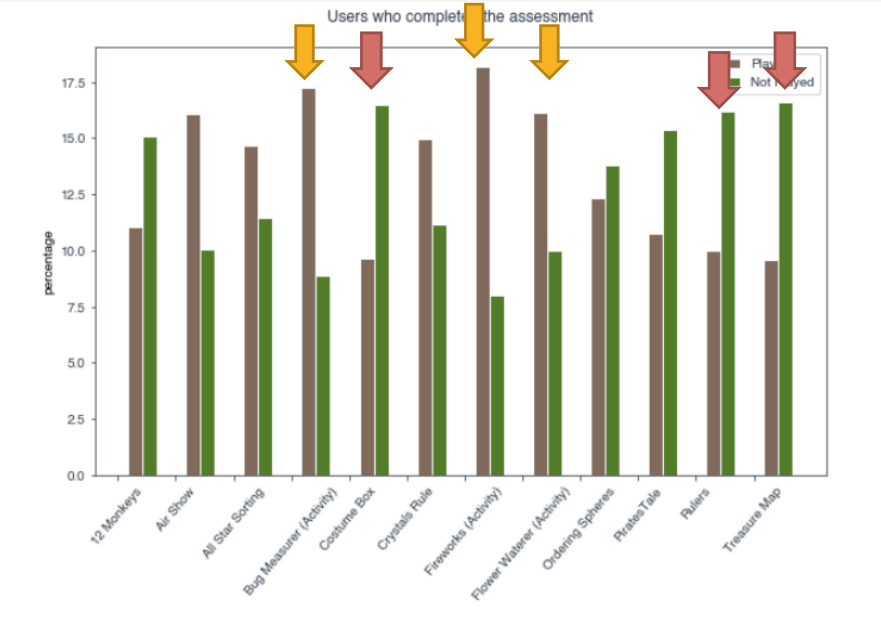
MAGMA PEAK



TREE TOP CITY

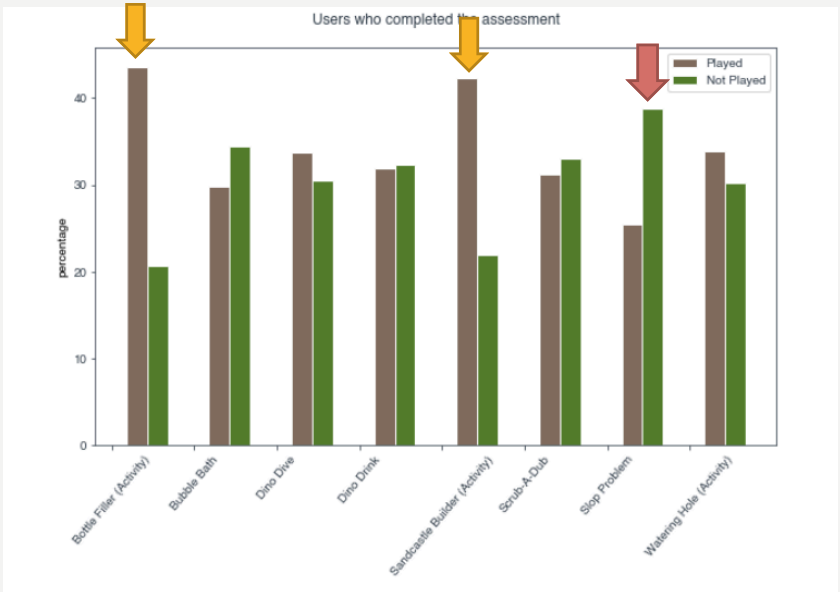
PERCENTAGE OF PLAY/NO PLAY





Most popular lessons ⬇ Played and Completed

Least popular lessons ⬇ Not played and Completed



CONCLUSIONS

POPULAR LESSONS AND ASSESSMENT COMPLETED

- Bug Measurer
- Flower waterer
- Fireworks
- Bottle filler
- Sandcastle builder

- Egg dropper
- Heavy-Heavier-Heaviest
- Leaf leader
- Pan balance
- Costume box
- Slop problem
- Treasure map
- Rulers

LEAST POPULAR LESSONS AND ASSESSMENT COMPLETED

RECOMMENDATIONS

- All the least popular lessons are either very complicated or video types lessons are conversational.
- Based on inference, these lessons do not contribute to earn good grades in assessment and hence these lessons can be replaced by popular lessons like activities which will help them to understand a concept better or videos which explains the concept in form of song .

THE END