

Design an Educational Game

Report template

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Overview

ADDSUB Stars by Jaime Solano

My idea of the game is to practice and learn addition and subtraction. There is a board game with 100 boxes, 50 boxes are orange and 50 boxes are blue. Students will play using two dice, they will move a checker the number of boxes that indicate the sum of the two dice. When a student falls into a box, he/she take a card from the color of the box, the orange cards are equations and the blue cards are word problems. In order to remain in the box, the student must answer the question correctly. If the student does not answer properly should return to the starting box. When the student answers a question correctly, he/she receives a golden star and if they do not answer correctly, they receive a white star. The goal is have more gold starts.

Instructional Objective

Students will be able to solve addition and subtraction problems within 10.

Standards:

- CCSS.MATH.CONTENT.K.OA.A.1: Represent addition and subtraction with objects, fingers, mental images, drawings¹, sounds (e.g., claps), acting out situations, verbal explanations, expressions, or equations.
- CCSS.MATH.CONTENT.K.OA.A.2: Solve addition and subtraction word problems, and add and subtract within 10, e.g., by using objects or drawings to represent the problem.
- CCSS.MATH.CONTENT.K.OA.A.5: Fluently add and subtract within 5.

Learners

The learners will be a kindergarten students in a bilingual school in Washington DC. They are 5-6 years old. 20% are Spanish speakers dominant, 30% are bilingual, 10% are English learners and their native language is not Spanish, and 40% are English speakers dominant. 15% of the students receive free and reduced-price lunch: 25%.

Motivation

The students have showed motivation with games that involved the use of dice. They show interest in solve word problems, this type of problems are challenging for the students and motivate them to find the answer. The game will provide an opportunity to peer learning and practice.

Context of Use

This game could be used for practice and evaluation. The use of the starts (golden and white) and the teacher observation could be the evaluation of the students. For example: the number of correct answers (golden starts) during the game.

Scope

This game does not have a specific duration, students could complete in 15 minutes or more than an hour. The game have 100 boxes, 50 boxes are orange and 50 boxes are blue, but the students do not need to pass in each one. This game could be used as an alternative activity, evaluation or center.

The game have cards with questions, 50 are word problems and 50 are mathematical equations. Also, the teacher could create different sets of cards with different levels of difficulty to differentiate.

Object of the Game

The goal of the game is finish the game with more golden starts.

Design Details

Initially, this game was designed as a board game, but I would like to include some ideas to add technological elements to improve it.

Universal Elements

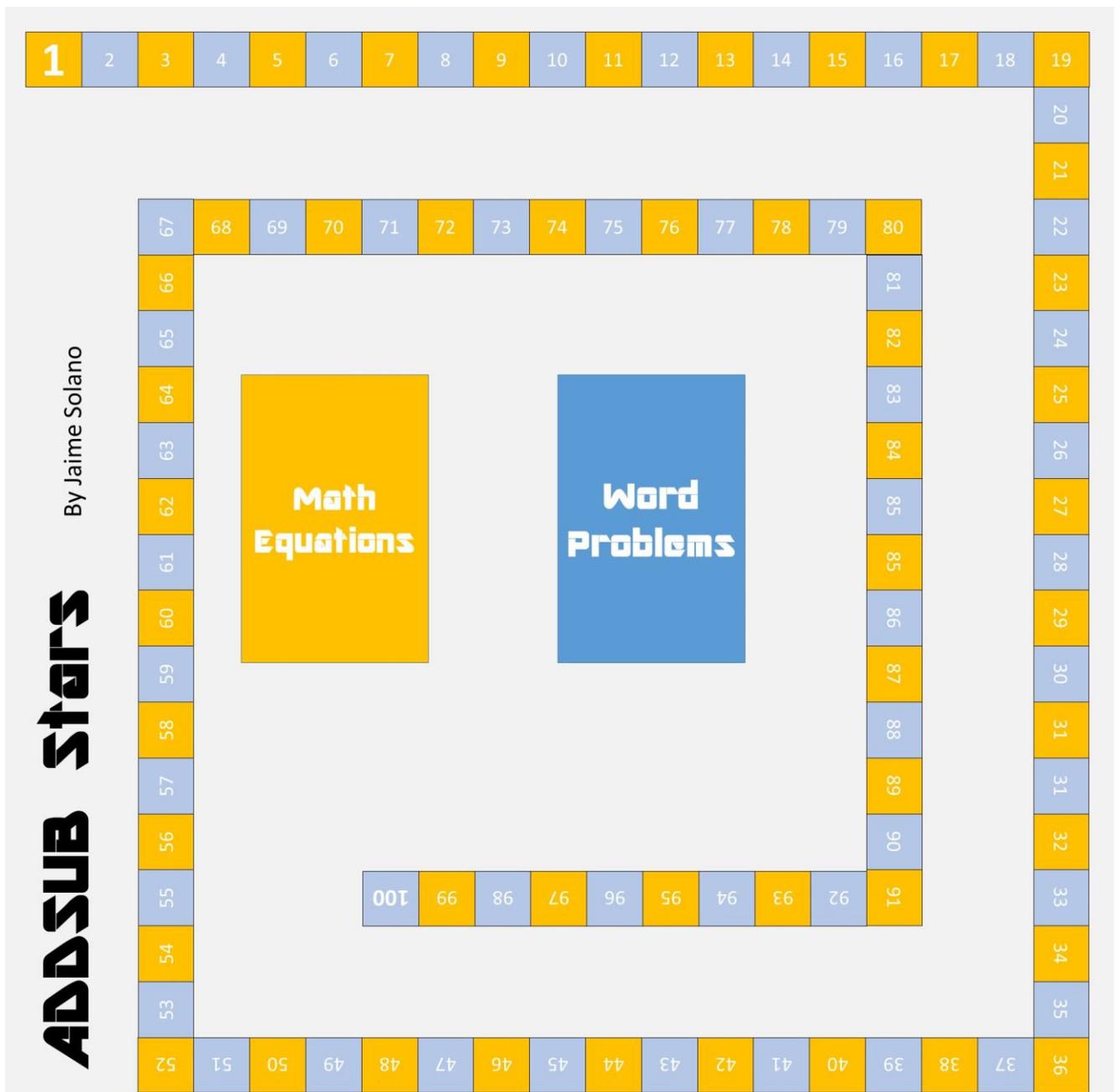
The board of the game include:

- 50 orange boxes
- 50 blue boxes
- A space in the middle of the board for blue cards (word problems)
- A space in the middle of the board for orange cards (Math equations)

The boxes are organized in form of spiral.

The idea for the board is have a tactile panel where the students move the checker. They will use the regular dice, then they will move their checkers the number of times that the dice indicate. When they put their checker in the final box, in the space in the middle of the board it will show the math equation or the video clip with the word problem (this video clip is a daily situation, could be represented by cartoons).

The board looks like the following image (draft of the board):



Specific Elements

For quiz games, provide:

- The scheme used for questions are divided in math equations and word problems. The set for each type has 50 questions that will show randomly. The word problems have the format of video of a daily situation (the format of video will help the English learners). Also, the teacher could create sets for different levels, for example using quantities greater than 10.

- An example of the questions in the cards are (the word problem should be represented by video):



The levels can vary using greater numbers or different format of questions. For example: $10 - \underline{\quad} = 7$

- The system of score is based on the correct or incorrect answer. When the student answers a question correctly, he/she receives a golden star and if they do not answer correctly, they receive a white star.
- If the student fail in the answer, they need to return to the last box and take a white star. Also, if the students fail counting the dots in the dice, they will return to the last box and they will get a white star.
- All the students who speak or share the answer when another student is playing, they will lose a golden star.

Technical Elements

- The specific software needed for the game could be a tablet with big screen.
- The game should be developed for android and IOS, this will help to run the game in different tablets like Ipad, Samsung, etc.
- The screen size should be at least 20 inches.
- The platform should reproduce HD video and audio.
- The platform should record the student's games providing the opportunity to restart a saved game.

Design Process

I started the process of design thinking in the area of knowledge which the game will be focused. When I decided to focus on math, specifically in addition and subtraction, I had the first question: which format I can use? To answer the question, I had to remember my time in

the elementary school and connect some ideas.

The first idea was the board game, something like Parcheesi. Then, I had the idea to include question in each box about addition and subtraction. At this moment the board game took form.

After the first idea of the board game, I start the process to include technology and improve the game. At this moment, I found the idea of the tactile board and including the audio-visual materials to complement the word problems.

Finally, I put together all my ideas and create the ADDSUB stars. I will continue working in the board game while I can have the budget to generate the technological version.