

RECYCLE: THE GAME

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Abstract

Recycle: The Game is a dice rolling and Mathematics learning board game that revolves around the theme of recycling. This game is designed for two to four players, each of them tries his/her best to use simple Math skills to discard all their 12 “garbage” tokens either into the garbage bin or into the recycling factory based on their rolled dice. This game is suitable for ages 8 and above as the game requires a player’s addition skills, at the same time the importance of recycling is inculcated. This is because if the player just discards their “garbage” token into the garbage bin, it will become “full” and the associate player has to take back their “garbage” token making the game competitive among players. Besides that, this game also shows different types of garbage bins and segregation of waste so that this game can influence kids to dispose of their waste appropriately and make the items recyclable. We hope that the young players will enjoy the game and at the same time gain knowledge on recycling, especially in these times and days.

Keywords: Recycle, Simple Mathematics, Board game, Fun Learning

Introduction

According to the United States Environmental Protection (EPA), they have defined recycling is a process of collecting and processing materials that could be thrown away as trash and converting them into new products. This can be a very good habit as recycling can help to reduce disposable waste in landfill sites. According to the Housing and Local Government, Minister Zuraida Kamaruddin (2018), the waste separation and the recycling rate in Malaysia is only 24% while the rest goes to the landfill. This can take up a lot of space for landfills and can lead to environmental pollution. One of the ways to encourage recycling in public is to educate people. The best way to do this is to start young. There are lots of ways to educate children and youngsters about recycling such as campaigns, books, exhibitions, and others but one of the interesting ways is through games. Hence, this game, purposely named Recycle: The Game, was created to let them have fun playing while learning about recycling.

Literature Review

Gamified learning means ‘the application of game-design elements and game principles to the context of learning’ (Cheng et al, 2021). The purpose of implementing the concept of gamification in education is to increase learners’ motivation for performing tasks or activities as motivation is a significant predictor of students’ academic achievement (Cheng et al, 2021). Additionally, this can motivate and engage learners in their learning process, and it fosters a deeper level of understanding of the topic (Hamari et al., 2016). Children are more sensitive to the natural environment and able to gain awareness as they can learn to produce something new using recycled materials (Zembat, Tosun, Çalış, and Yılmaz, 2020). It is important for the students to learn their point of view on the appropriate use of recycled materials so that they can discover their own creativity by using their own imagination. For this reason, materials need to be attractive and suitable for the level of the students (Karabay, 2020).

Methods

Recycle: The Game can be played among 2 to 4 players. The goal of the game is to eliminate all 16 tokens of “garbage” into the recycle bins or normal bins that are numbered 1 - 13 and the first player that does so, wins the game. At the start of the game, open the board game with board numbers 1 to 6 at the top, followed by board number 7 in the middle and board numbers 8 -13 at the bottom. Then, players choose which colour token they want. Each player rolls a dice and whichever player obtains the highest number starts the game, then the turn continues clockwise. The first player starts the game by throwing 3 dice together. The Player then decides to use their values separately or add them up. In each round, the player can eliminate either 1 to 3 tokens based on the number of rolled dice into the bin. For example, if a player rolls numbers 6, 4, and 1, the player can place the token, starting from the lowest position, in bin 1, bin 4, and bin 6. Alternatively, the player can get rid of only 2 or 1 token by adding the rolled number of dice. For example 6 and (1+4) or 1 and (6+4) or 6+4+1.

To make the game a bit challenging, for bin 3 (glass), bin 4 (paper), bin 5 (plastic), bin 8 (e-waste), bin 9 (metal), and bin 10 (organic), only specific tokens can be used. Any token can be placed into the bins that do not state the type of waste.

When playing the game, place the token in the lowest position of the bin. If the lowest position is occupied, move the token into the second position or third position based on the bin. A maximum of 3, 2, or 1 token can be placed in each bin. If the bin is “full”, return the top token to its owner. Take turns rolling the dice and placing the token until a player finishes all the tokens, and that player is declared the winner.

Special rules during gameplay:

- 1) Bin 7 is a recycling factory. This means that it can hold an unlimited number of tokens from players, 1 token per turn from each player.
- 2) If the player rolls exactly a total of 7 out of 3 dice, and the player decides to put 1 token in bin 7, they can roll again. But if the player manages to get a total of 7 again, they can put the token in either bin and the turn ends.
- 3) The player must use all the dice numbers thrown by them. In the event that he/she cannot put the token into specific bins because the specific token(s) is not available, the turn is skipped.



Sample of the game

Results and Discussion

Based on the survey forms distribute, a total number of 30 responses among Form 2 students from SMK Bawong, Sg Siput (U) Perak were collected at the end of the game. There is a total of four questions consisting of three questions that are “Ya” or “Tidak” – type questions while the fourth question is a test to see if they remember the types of recycling bins.

From the survey conducted, 93.33% said that the game was fun to play while 6.67% of the 30 respondents said no. Besides that, for Question 2, 86.67% said that they want to invite their friends to play this game and 13.33% stated no to the answers. Question 3 asked if they have learned something about recycling through this game and 93.33% stated yes to the answers while only 6.67% said they did not. For the fourth question about the types of recycling bins, around 22 students, or 73.33% of the students stated all 6 types of recycling bins that were introduced in this game.

Soal Selidik Mengenai Permainan "RECYCLE: THE GAME"

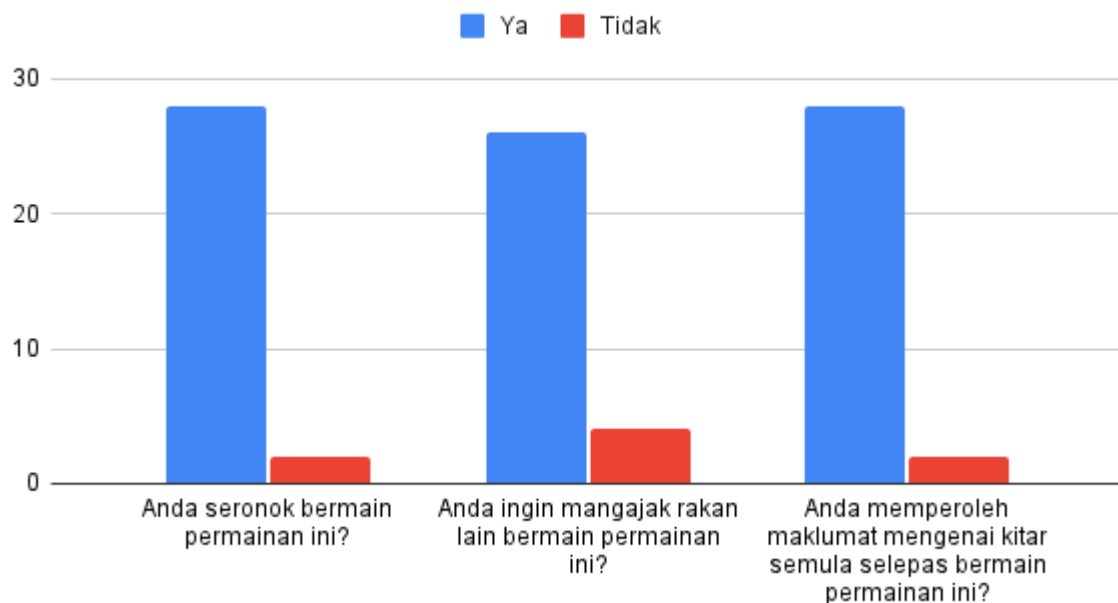


Figure 1. Soal Selidik Mengenai Permainan “RECYCLE: THE GAME”

Conclusion

In summary, playing Recycle: The Game is one of the ways to educate youngsters to recycle. However, this is not the only approach that can be taken to educate youngsters as traditional ways of teaching and learning method can still be used. This game is for teachers to assist students with recycling. According to Heather Baid & Nicky Lambert (2010) in their book *Enjoyable Learning: The Role of Humour, Games, and Fun Activities in Nursing and Midwifery Education*, games can help to promote learners to actively participate in learning activities. This means that, through this game, it is hoped that the learners can understand the importance of recycling and this knowledge can be extended to loving and caring for the environment.

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