2048 Game

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Teacher Notes

7 8 9 10 11 12

TI-Nspire™ | Investigation | Student | 50 min

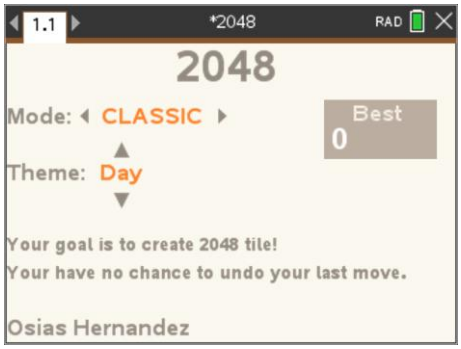
This game can be addictive! Students will however become more adept at 'doubling' and strategizing. There are numerous reasons for introducing the game:

- Problem solving
- Develop strategies
- Resilience
- Practice using the Navigation pad on TI-nspire.

There are numerous strategies that may be employed. Keeping the largest number to one side, or a single corner works well, then keep building up the numbers around it, being careful not to trap small numbers!

Instructions

Save the 2048 game to your calculator and open the file.



To start the game, use the default settings:

Mode: Classic

Theme: Day

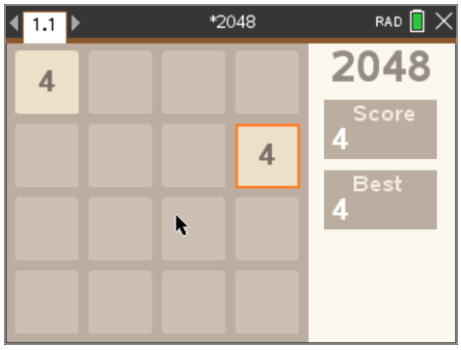
Press enter to start.

Think of the board as being able to 'tilt': left / right / up / down.

When the board is tilted the tiles slide in the corresponding direction. As tiles do their imaginary slide, if they have the same value, they will be added together. For the sample shown opposite tilting would result:

- ◀ (left) 4 in the top left square
- ▶ (right) 4 in the top right square
- ▼ (down) Two tiles with 2 on the bottom row.
- ▲ (up) No tiles will move

As the tiles move, a new 'random' tile is created. The new tile will contain either a 2 or a 4 and be placed in a random location on the board.

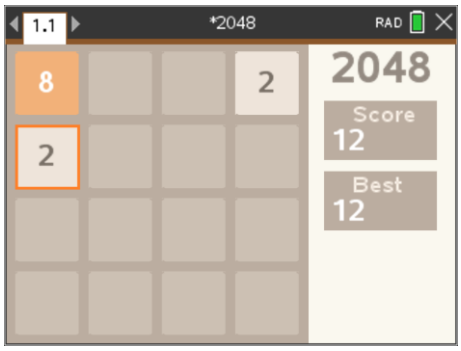


Which way was the previous board tilted (which arrow key was used)?

Given the random placement of the new 4, there is no immediate way of combining these two tiles. The board can be tilted in any direction here, but as you play the game, you will realise there are strategic ways to move, even in these early stages.

Authors: Peter Fox

The board has been tilted two more times to get to this point.



The 8 could have been achieved by tilting:

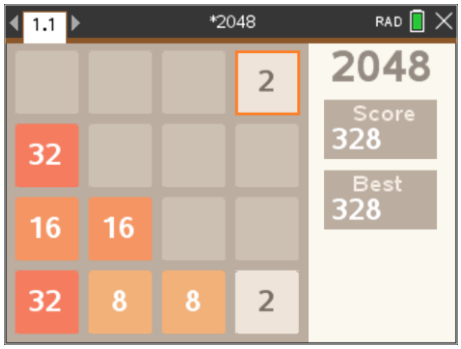
Up then Left

Left then Up

The tile added most recently is surrounded by an orange square.

Which one of the above combinations must have been used to arrive at this point in the game?

The game has continued for several more moves. In the next two moves it is possible to have a tile with 64 on it.



The aim of the game is to finally have a tile with the number: **2048** on it, of course more and more tiles will start to fill the board, so the game gets harder and harder the further you progress.

Keep playing and see how far you can go. You can use the software or the TI-Connect browser page to capture your best score.

The board is filling up fast, not many empty squares left, however, this game is far from over! Consider the following sequence:

- Tilt Left
- Tilt Left
- Tilt Up
- Tile Left
- Tilt Up

Following the above moves, the game board contained 7 empty squares!

Questions:

Record your highest score for the first 10 games and graph the result.

Game:	1	2	3	4	…	10
Score:						

Is your game improving?

Discuss and record strategies as you play more and more games. Strategies may change as your game skill improves, while the game includes some luck elements, skilled players, on average, score much better.

Teacher Comments:

It is easy to take a superficial look at this game and conclude the *only* skill that students are using is how to double numbers. Mathematics is much more than performing a series of algorithms. As students play the 2048 game they are developing and evaluating strategies, building resilience as they fail many, many times before or even if, they ever reach the target tile: 2048. Students focus on improvement, an important lesson that can be transferred to their day to day learning of mathematics. Engaging in recreational mathematics is also a delightful way to help students foster a love of the subject.

Credits: The original game was written by Gabriele Cirulli (web developer) and based on the game Threes, which uses many of the same skills and concepts. Osias Hernandez adapted the game to suit TI-Nspire series calculators.

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