Bin packing game instructions

The bin packing game is designed to simulate an important Operational Research problem; how to best pack objects of different sizes into a given space.

Playing the game

The game starts with a level and game selection screen.

There are three levels of play, and twelve problem games in each level. In standard play, each game must be completed to unlock the next game, and each level completed to unlock the next level. To select a level or game, click or tap the appropriate area of the screen.
Level 1

Level 1 has simple game play. Bags appear from the bottom of the screen and move up the baggage belt. When a bag reaches the top of the screen, you have opportunity to select it to be added to the storage bin, or let it go by. The baggage belt is circular, so items leaving the top of the screen will eventually reappear at the bottom. Your task is to:

- Pack a full bin with as little wasted space as possible.
- Where only part of a bin is used, pack using as few rows as possible.

A bag can only be selected when it has a yellow outline. To select a bag you can:

- Click on it with a mouse.
- Tap it on a touchscreen board, tablet or smart phone.
- Press space on the keyboard.

The bag will be moved to the first available space in the bin where it will fit. Eventually, you may arrive at a situation where you cannot fit any more bags into the bin. At this stage, you need a new bin. To do this

- Click or tap the ‘Full’ button.
- Press the ‘F’ key on the keyboard.
When you’ve placed all your bags, you will get a score based on how well you did – your target is for an efficiency of 100%

After playing a game in a level, you have the choice of replaying the same game to beat your previous score ☐, returning to the menu ☐, or moving on to the next game ☐.
Level 2

Level 2 is similar to level 1, except now when you select a bag, it is moved to the top-right of the bin. You have to manually place it where you want it in the bin. To do this:

- Click on the motion controls at the bottom-left of the screen with a mouse.
- Tap on the motion controls on a touchscreen board, tablet or smart phone.
- Use the arrow keys on the keyboard.

When the bag is where you want it you can drop the bag with

- The on-screen drop button
- Pressing ‘Enter’ on the keyboard

You can only drop a bag if its position does not overlap other bags in the bin. On screen this is shown as

- Bag outlined in green – ok to drop
- Bag outlined in red – you can’t drop.
If you decide you don’t want to use the bag you can return the bag to the belt with

- The on-screen drop button
- Pressing ‘B’ on the keyboard
Level 3

Level 3 is similar to level 2, except now you have the added complication that you can rotate bags to get them in the best possible position. To rotate a bag:

- Click on the rotation control at the left of the screen with a mouse.
- Tap on the rotation control on a touchscreen board, tablet or smart phone.
- Use the ‘space’ bar on the keyboard.

Good luck!

Summary of controls

On-screen use is via the various buttons. In addition the following keys can be used during game play:

- Select a bag: Space bar
- Move bags: Arrow keys
- Rotate a bag: Space bar
- Drop a bag: Enter
- Call for a new bin: F key
- Send the bag back to the belt: B key
Credits

Original concept       Rasseeda Virgo
With help from        Andrew Long
Graphic design        Jenny Egerton
Coding, development & Maths Chris Robbins, Grallator

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