

Hive Rules

Game

Starting with white, players alternate turns performing a single **action** (*pass*, *place* or *move*) until a Queen Bee is completely surrounded. The game ends in a draw if both Queen Bees are surrounded in the same turn, otherwise the player whose Queen Bee is surrounded loses the game. The game may also end in a draw if the players have exactly repeated the same position three times, or if it is mutually agreed upon.

Passing

A player may **pass** if and only if he can neither **place** nor **move**.

Placing

A player may **place** a **bug** provided that the following rules are respected:

- the first white **bug** is placed in any **cell**; it cannot be the Queen Bee
- the first black **bug** is placed in any **adjacent cell**; it cannot be the Queen Bee
- subsequent **bug** placements must satisfy the following conditions:
 - the new **bug** must be placed in an **empty cell adjacent** to the **hive**
 - the new **bug** must not be **adjacent** to a **cell** of the opponent's **color**
 - the Queen Bee must be placed at the latest during the fourth turn of a player

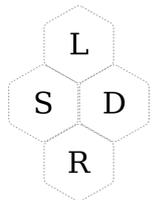
Moving

A player may **move** a **bug** provided that the following rules are respected:

- his Queen Bee has already been placed
- he's using the movement ability (see below) or the **power** of one of his **bugs**

Basic Movements

A **step** takes a **bug** from a source **cell** S to an **adjacent** destination **cell** D. This movement goes between two bordering **cells**, L and R, which are the only **cells adjacent** to both S and D.



A **crawl** is a purely horizontal movement. It must satisfy the following conditions:

- the **bug's level** is equal to D's **height**
(otherwise the movement is not horizontal)
- either L's **height** or R's **height** is less than or equal to the **bug's level**
(otherwise the **bug** is blocked by the gate formed by L and R)
- either the **bug's level** or L's **height** or R's **height** is strictly greater than zero
(otherwise the **bug** loses contact with the **hive** while sliding)

A **climb** is the combination of a purely vertical movement (during which the **bug's level** increases to be equal to the destination **cell's height**) and then a **crawl**.

A **fall** is the combination of a **crawl** (during which the **bug** stays at the same **level**) and then a purely vertical movement (during which the **bug's level** decreases to be equal to the destination **cell's height**).

Movement Abilities

- Ant: one or more ***crawls***
- Beetle: one ***step***
- Grasshopper: one ***jump*** in a straight line, over one or more ***occupied cells***, into an ***empty cell***
- Ladybug: one ***climb***, then one ***crawl*** or ***climb***, then one ***fall*** into an ***empty cell***
- Mosquito: it can copy the movement ability of an ***adjacent bug*** which is not ***covered***
 - if on the ***ground***: it can behave like any non-Mosquito ***bug*** atop an ***adjacent stack*** (if it is only adjacent to a Mosquito then it cannot move)
 - if not on the ***ground***: it behaves like a Beetle
- Pillbug: it can either move itself or move another ***bug*** (which must be ***adjacent*** and on the ***ground***)
 - if moving itself: one ***crawl***
 - if moving another ***bug***: one ***climb*** onto itself, then one ***fall*** into an ***empty cell***
- Queen Bee: one ***crawl***
- Spider: exactly three ***crawls***

Restrictions

- a ***covered bug*** cannot ***move*** and it cannot use its ***power***
- a ***pinned bug*** cannot ***move*** but it can use its ***power***
- a ***resting bug*** cannot ***move*** and it cannot use its ***power***
- ***no backtracking***: during a sequence of ***steps***, the moving ***bug*** cannot enter a ***cell*** it has already visited; notably, it cannot end the sequence in its starting ***cell*** (i.e. a null ***move*** is not allowed)

Glossary

- ***action***: what a player can do during his turn (can be ***place***, ***move*** or ***pass***)
- ***adjacent***: two ***cells*** are ***adjacent*** if they share a common side (a ***cell*** has six ***adjacent cells***)
- ***bug***: a game piece
- ***cell***: a location in the virtual hexagonal grid on which the game is played (can be ***empty*** or ***occupied***)
- ***climb***: an ascending ***step*** during which the ***bug*** goes to a higher ***level***
- ***color***: the ***color*** of a non-empty ***cell*** or ***stack*** is the ***color*** of its topmost ***bug***
- ***covered***: a ***bug*** is ***covered*** if it has one or more ***bugs*** on top of it
- ***crawl***: an horizontal ***step*** during which the ***bug*** stays at the same ***level***
- ***empty***: a ***cell*** or ***stack*** is ***empty*** if it does not contain any ***bugs***
- ***fall***: a descending ***step*** during which the ***bug*** goes to a lower ***level***
- ***ground***: the playing surface (a ***bug*** on the ***ground*** is at ***level*** zero)
- ***height***: the number of ***bugs*** in a ***stack*** (an ***empty stack*** has a ***height*** of zero)
- ***hive***: all the ***bugs*** already in play
- ***jump***: a type of ***move*** in which the ***bug*** goes directly from one ***cell*** to another one (without ***steps***)
- ***level***: the position of a ***bug*** in its ***stack*** counted as the number of ***bugs*** underneath it
- ***move***: the ***action*** of moving a ***bug*** within the ***hive*** (can be a sequence of ***steps*** or a ***jump***)
- ***occupied***: a ***cell*** is ***occupied*** if it contains one or more ***bugs***
- ***pass***: the ***action*** of not doing anything during a player's turn
- ***pinned***: a ***bug*** is ***pinned*** if it is located at an articulation point (i.e. if removing it from the ***hive*** would split the ***hive*** into multiple disconnected parts)
- ***place***: the ***action*** of putting a new ***bug*** in play (i.e. from the player's ***reserve*** to the ***hive***)
- ***power***: a ***bug***'s special ability (for Mosquito and Pillbug)
- ***reserve***: all the ***bugs*** that are not yet in play (each player has his own ***reserve***)
- ***resting***: a ***bug*** that has moved (or has been moved) during a turn will be ***resting*** during the next turn
- ***stack***: a group of zero or more ***bugs*** occupying the same ***cell***
- ***step***: the atomic motion of a ***bug*** from one ***cell*** to an ***adjacent cell*** during a ***move*** (can be ***crawl***, ***climb*** or ***fall***)