



Invertebrate Life Cycle Game

Insects grow and change just like people do! Insect life cycles are, however, much different from humans because bugs start as eggs outside of their parents' bodies, and some bugs change forms and gain new body parts as they grow.

There are two distinct life cycle types that insects can follow: **metamorphosis** and **direct development**.

- **Metamorphosis** is when an animal changes form between life stages. The life stages during insect metamorphosis are:
 1. **Egg**
 2. **Larva**- the insect's only job in this stage is to eat and become plump to help prepare for the next stage.
 3. **Pupa**- during this stage, the insect is not moving or eating. This is where the chemical process of changing form (growing wings) happens. To protect itself, the insect needs to spin a cocoon or form a hard shell like a chrysalis.
 4. **Adult**- after the pupa stage, the insect with wings. The adult's main job is to mate and lay eggs to start the cycle over again!
- **Direct development** is when an insect goes directly from egg to juvenile (nymph) to adult. In all three life stages, the insect looks similar. The life stages during direct development are:
 1. **Egg**
 2. **Nymph**- young, smaller version of the adult insect. It molts, or sheds its exoskeleton, in order to grow.
 3. **Adult**- can now mate and lay eggs.

Pre-Game Discussion:

- What might be benefits of going through metamorphosis? What might be some negatives?
- What might be benefits of going through direct development? What might be some negatives?
- Can you think of other animals that undergo metamorphosis? (Hint: One says "ribbit.")
- Some ants can lay 4 million eggs at one time! Why do you think insects lay so many eggs?

How to play:

Before playing, print the cards on heavy paper and cut out. Only use as many insect groupings as there are players. The object of the game is to find all the other life stages for your insect.

With 10 or more players-

- Some of the insects go through metamorphosis and will need four players to complete the life cycle. Some of the insects go through direct development and will need to find three players to complete the life cycle.

- Players should look at their card and figure out if they need to find two or three other players.
- Then each player goes around and asks the other players if they are part of the same life cycle.
- Be careful — along the way you might encounter a parasite! If a parasite finds you, your insect is now “infected,” and its life cycle will not be able to be completed. The player who has been caught should announce what life cycle they are and all players for that life cycle will gather with the parasite. Parasites can only catch one group per round.
- Once a group of players has all three or four of their life cycle parts, they cannot be found by a parasite and should stand together off to the side.
- Any groups who are able to find all of their life cycle parts without being caught by a parasite have successfully made it to adulthood!

Tips:

- Define clear borders for where you will play the game.
- To make it easier, parasites can reveal themselves at the beginning of the game.

To play as a card game with 3-6 players:

- Deal out three cards to each player, then put the other cards in a pile in the middle
- Play like “Go Fish.”
 - Each player can ask one other player if they have a card to match with one of the life cycles in their hand. They must ask for a specific stage of the life cycle (dragonfly nymph, moth adult, ant egg, etc.). *Tip- write out all of the life cycles so players know which cards to ask for.
 - If the player does have that card, they must hand it over.
 - If a player doesn’t have the card in question, then they tell the player to try again and the player has to pick a card from the middle pile.
 - If a player doesn’t have the card in question but does have a parasite card, they can give the parasite card to the other player. If this happens, the life cycle that was in question can no longer be completed. Put those cards off to the side, but leave them visible so all players know that all parts of that life cycle should go there.
 - Once a player has a complete life cycle, they put it off to the side.
 - The player with the most life cycles completed at the end of the game has helped the most insects make it to adulthood!

Post-Game Discussion:

- Have each player or group keep their cards and discuss with each other, what order they think their cards go in.
 1. What do you think happens at each stage (egg, larva, pupa, adult, nymph)?
 2. Why might it be beneficial for creatures to go through metamorphosis?
- What was it like to try to find all of the life cycle parts without being caught by a parasite?
- Is this game similar or different to how insects grow in real life? Why?

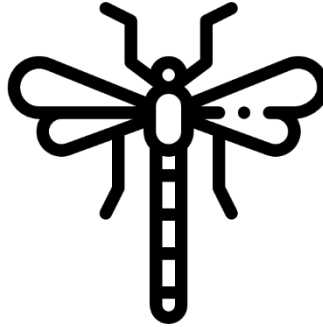
Dragonfly Egg
Direct Development



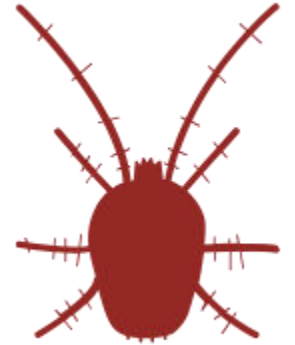
Dragonfly Nymph
Direct Development



Dragonfly Adult
Direct Development



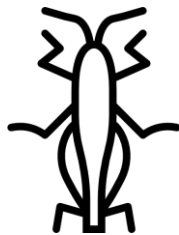
PARASITE!



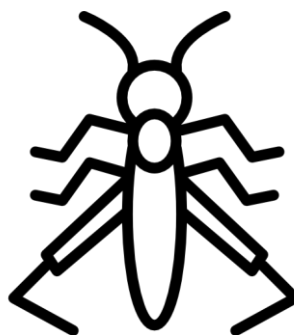
Grasshopper Egg
Direct Development



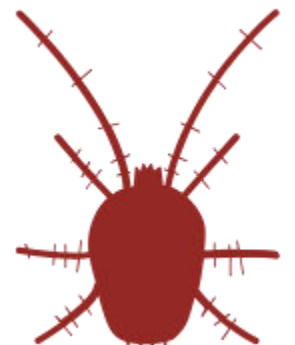
Grasshopper Nymph
Direct Development



Grasshopper Adult
Direct Development



PARASITE!



Praying Mantis Egg
Direct Development



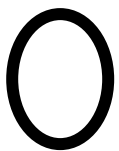
Praying Mantis Nymph
Direct Development



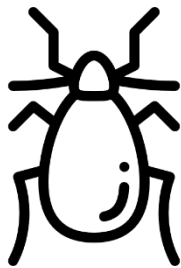
Praying Mantis Adult
Direct Development



Termite Egg
Direct Development



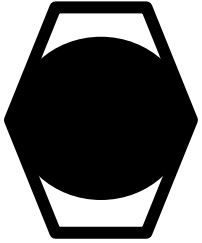
Termite Nymph
Direct Development



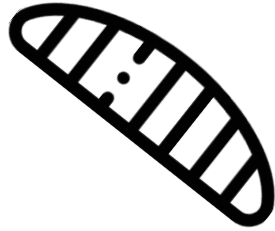
Termite Adult
Direct Development



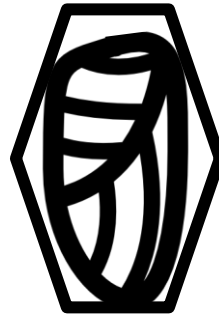
Bee Egg
Metamorphosis



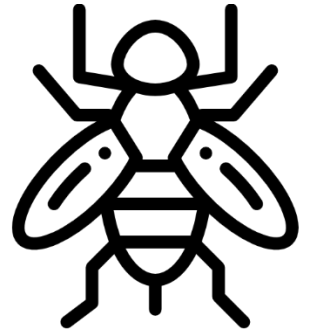
Bee Larva
Metamorphosis



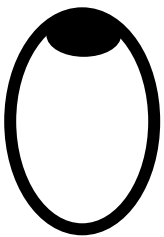
Bee Pupa
Metamorphosis



Bee Adult
Metamorphosis



Ant Egg
Metamorphosis



Ant Larva
Metamorphosis



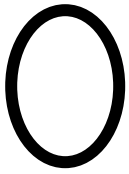
Ant Pupa
Metamorphosis



Ant Adult
Metamorphosis



Flea Egg
Metamorphosis



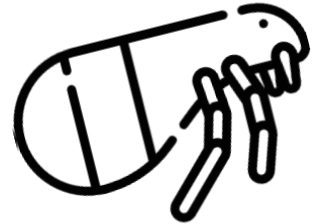
Flea Larva
Metamorphosis



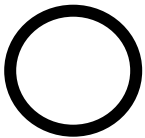
Flea Pupa
Metamorphosis



Flea Adult
Metamorphosis



Moth Egg
Metamorphosis



Moth Larva
Metamorphosis



Moth Pupa
Metamorphosis



Moth Adult
Metamorphosis



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