

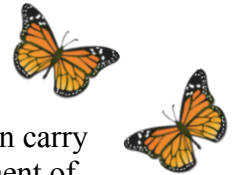


Black-headed Grosbeak Migration Game

Today you are going to experience all the challenges a Black-headed Grosbeak might encounter along its migration. Before you begin your journey, there are a few materials you need to gather and some background information to review.

Materials:

1. Printed sheet of migration obstacles (found on the SDAS website)
2. Scissors (to cut out the obstacle cards)
3. 10 – 15 small items to use as “Energy Insects” – something small you can carry along your migration – beads, cotton balls, chips, or even just an assortment of small items



Background:

The Black-headed grosbeak is a special bird that migrates through San Diego. A migration is when an animal moves from one region or habitat to another, usually to look for better food, weather, or nesting sites. In San Diego there are many resident birds which live here all year long, but there are also many migratory birds that stop by temporarily. Birds use cues from nature to help them decide when to migrate. They use things like changes in the length of daylight, temperature, or type of food available as indicators that it might be time to start migrating. These changes occur at particular times of the year. For example, leaves may change and temperature drop in fall, while days get longer and flowers bloom in spring. The study of how the biological world times natural events throughout the year is called phenology. Grosbeaks rely on phenological events to time their migration. In spring and summer, grosbeaks live in Northern California. As the seasons change, they migrate south searching for warmer temperatures and more food. During the same months, something very special happens in central Mexico. Millions of monarch butterflies arrive to spend their winter months at the Monarch Butterfly Biosphere Reserve. Monarchs are poisonous to most predators, but grosbeaks are one of few special birds that can feed on them, making the reserve an important habitat and food source for grosbeak survival. Grosbeaks time their migration precisely during the gathering of the monarch butterflies. If the grosbeaks leave California too soon or too late, they will miss the hatching of millions of monarchs they rely on as food. This is called phenological mismatch, when important events are misaligned with one another.



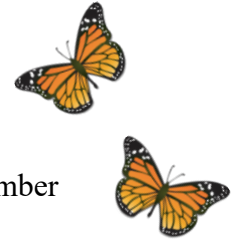
To learn more about the many challenges a grosbeak faces along migration, imagine yourself transformed into a Black-headed grosbeak and ready to take flight! Grosbeaks fly from Northern California all the way to central Mexico each year, about 1,700 miles! Like any animal on a long migration, grosbeaks rely on energy to survive their long journey. In our game, as a grosbeak you will start out with 5 “Energy Insects” to fuel your trip. You need to arrive in central Mexico with at least 3 “Energy Insects”. As you encounter obstacles along the way, you can either lose or gain “Energy Insects”.

Set Up:

1. Print and cut out the migration obstacle cards. Don't have a printer? It might take a little more time, but you can make your own cards using scrap paper!
2. Find 10 to 15 small objects to use as "Energy Insects". You can set these off to the side for now. Remember you'll start your migration with 5 and the goal is to have at least 3 with you when you reach your final destination.
3. Find an area in your home or outdoors with space to spread out. Designate one side of your space as Northern California and the other side as central Mexico.
4. Shuffle your obstacle cards and place 5 cards on the ground with the word Obstacle facing up. Set them about equal distance apart.

Playing:

1. Begin your migration in Northern California with 5 "Energy Insects"
2. Move south to your first "Obstacle" card. Read the card and follow its instructions. If the card says to "lose" energy insects, you'll drop the number of insects on the ground. If it says to "gain" energy insects, collect more insects from the supply you set aside earlier.
3. Continue moving south along your migration route, reading each obstacle card along the way and either gaining or losing insects.
4. If you complete your final obstacle card with at least 3 "Energy Insects" it means you had a successful migration! If you arrive with less than 3 "Energy Insects", you either didn't have enough energy to complete your migration or arrived at the wrong time of year.
5. You can reset your game, adding in new obstacle cards and can even try starting with fewer "Energy Insects" if you're up for the challenge!



Wrap Up:

Many birds time their migration with changes in temperature and food availability. As our climate begins changing and San Diego sees the arrival of new invasive species, birds might migrate sooner or later than in years past. Scientists at Audubon have created models to predict how bird habitats may shift due to changing climate. Here in San Diego we could see the grosbeak's summer habitat shift north. This means a longer migration which would require more food and expose birds to more obstacles. Now that we've completed our migration, let's take a few minutes to think about these questions:



1. Do you think life is easy for a Black-headed grosbeak?
2. What obstacle do you think might have the biggest impact on a grosbeak and why?
3. What is one thing you can do to help protect nature spaces or resources for animals here in San Diego?

Thanks for playing our game! Interested in learning more about animal migrations? Monarchs and grosbeaks aren't the only ones who migrate, tons of other animals go on amazing journeys each year! Check out the migrations of Arctic Terns, Ospreys, or Peregrine Falcons for some amazing stories!



Obstacle	Obstacle	Obstacle
Obstacle	Obstacle	Obstacle
Obstacle	Obstacle	Obstacle
Obstacle	Obstacle	Obstacle

<p>Good news! You found a full bird feeder on your migration!</p>  <p>Gain 3 Energy Insects</p>	<p>A new wildlife preserve has been created! Time to rest your wings and relax.</p>  <p>Gain 2 Energy Insects</p>	<p>You've worked up a thirst! Stop at a bird bath for a refreshing drink.</p>  <p>Gain 3 Energy Insects</p>
<p>You're in luck! The weather is in your favor. It's clear skies ahead!</p>  <p>Gain 2 Energy Insects</p>	<p>You don't have to beat your wings so hard! The winds are in your favor!</p>  <p>Gain 2 Energy Insects</p>	<p>You can fly easy knowing there are no predators in sight.</p>  <p>Gain 1 Energy Insect</p>
<p>Uh oh... There's a storm ahead and you have to wait it out.</p>  <p>Lose 1 Energy Insect</p>	<p>You barely escaped the talons of a hawk and now you're exhausted.</p>  <p>Lose 2 Energy Insects</p>	<p>Strong winds are slowing you down and making you tired.</p>  <p>Lose 2 Energy Insects</p>
<p>You stopped for food but all the bushes have been taken over by invasive species.</p>  <p>Lose 3 Energy Insects</p>	<p>Oh no... you arrived too soon at one of your favorite feeding spots. The berries aren't ready.</p>  <p>Lose 3 Energy Insects</p>	<p>You are flying through a new city and get confused which direction to go because of all the tall buildings.</p>  <p>Lose 2 Energy Insects</p>