

# Arctic Tern Migration Simulation

## Background information:

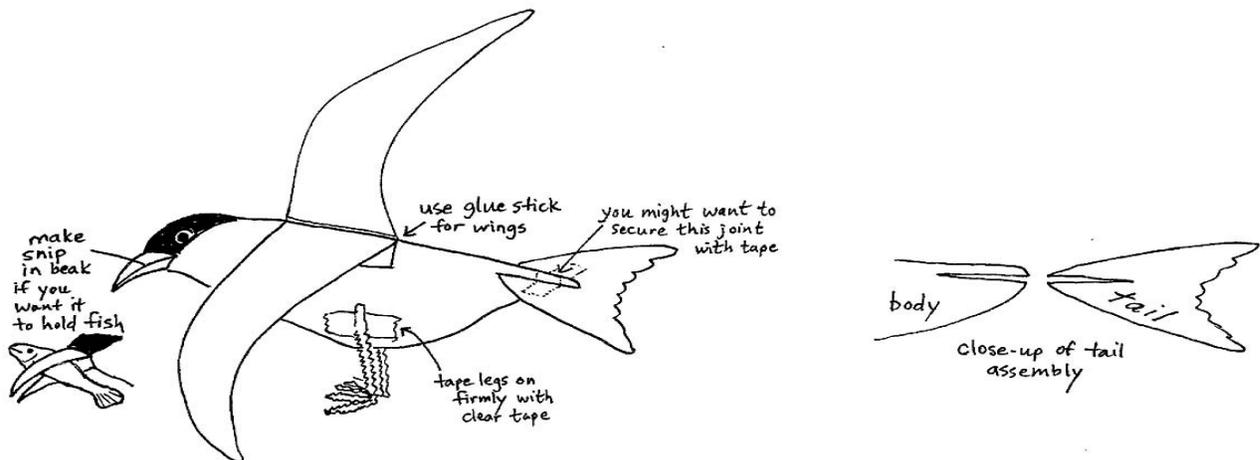
The arctic tern holds the world record for the longest migration. It spends summers in the Arctic (June-August) and also in the Antarctic (Dec.-Feb.). It sees more hours of sunlight than any other animal on earth. Terns are a medium-sized bird between 12-15 inches in length. They can live up to 20 years. They eat mainly fish and small invertebrates such as krill, diving into the water to catch them. This activity will take you through half a year in a tern's life, from June-December.

## You will need:

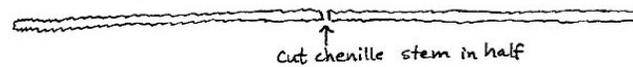
- One copy of the pattern page per student, copied onto heavy card stock
- One copy of the map posted for the whole class to see
- One copy of the wing page (sitting ready to use during a mid-migration discussion)
- Scissors
- Glue stick
- Clear tape (to tape on feet)
- An orange-red (or just orange) crayon or colored pencil (to color the beak)
- Orange chenille stem (i.e. pipe cleaner) per player (can substitute yellow, red, or white)
- A copy of the map posted for the whole group to see
- Something to mark progress on map, such as a marker, a sticker, or a tack
- Snippets of green or tan yarn to represent dried grass (3-6 inches in length), about 15-20 per player

## Set-up directions:

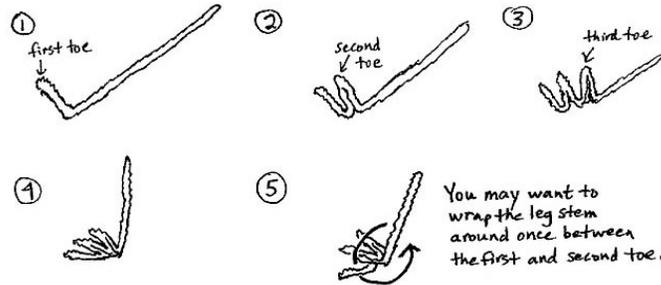
- 1) Tell the students to cut out the four main bird parts first: the two wings, the body and the tail. If you get the wings glued on right away, they will have time to dry while they cut out the other parts. If the student wants to make the reverse side of the body match the printed one, they may also cut out the extra head and tail pieces provided and glue them to the reverse side. (If you want students to put their names on their birds, now would be a good time to do so.)
- 2) Have each student cut out their bird parts and assemble as follows:



To make legs:



For each half, do the following:



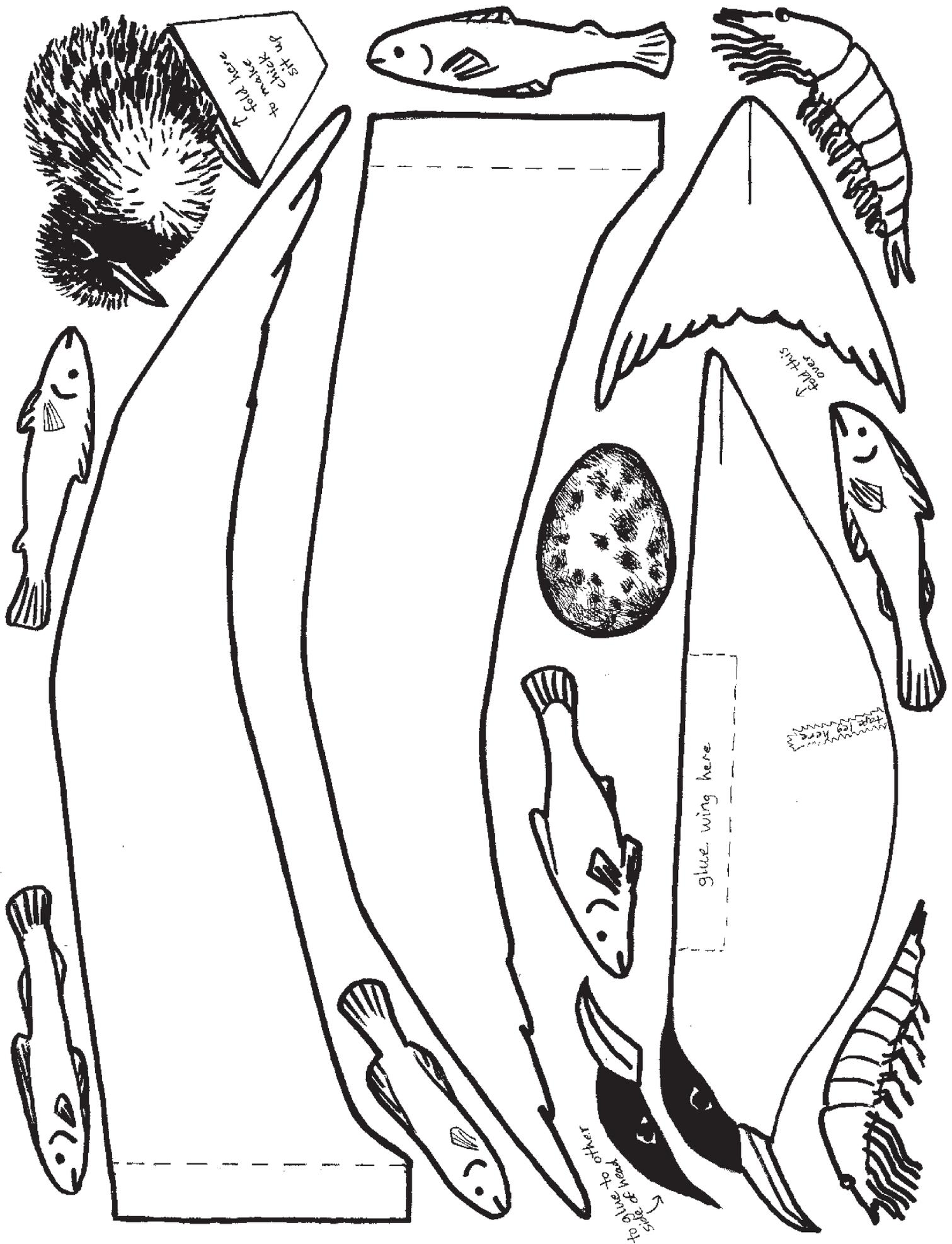
- 3) Then cut out the egg, the chick, and the fish and krill. Not every student will need their egg and chick, so if there are some slow cutters, they do not need to do the additional cutting. It will be helpful to know this if you are pressed for time. If even half the class has their eggs, chicks, and fish, that will be enough to make the game work.
- 4) Divide the snippets of green yarn into several piles and put them at the edges of the room. Place paper fish in the middle of the room in an imaginary body of water. The krill can be mixed in, also, or you may want to save the krill for when the birds get to Antarctica, since krill are especially abundant there.
- 5) You will need to assign players to small groups of 2, 3, or 4. A group of 3 is ideal, as two will play the parent birds, and one will be the chick. For a group of 4 players, two are the parent birds and the nest will have two chicks instead of just one. A group of just 2 players is slightly awkward, but can be done. For 2 players, they can each be a parent bird, and hatch out two babies, one for each player (so they will have two birds each to fly south), or they could share the baby and take turns with it.
- 6) Within these small groups, assign which player is playing the mother bird, and which is playing the father bird, and which is/are the chick(s). They will need to follow separate instructions during egg-hatching season. After the chicks are grown, all birds will follow the same directions for the rest of the game.



## Playing instructions:

- 1) Plot starting point on map: anywhere along the Arctic Ocean. (Recommended: somewhere along the northern coast of Alaska, then follow the route to the west of the Americas.)
- 2) Explain that it is summer and the terns are enjoying the Arctic sunlight. It is egg-hatching season. Female birds begin by doing “high flights,” where they will chase a male to a high altitude then gradually descend.
- 3) Next, the males will do “fish flights” where they go fishing and then offer fish to the females. Fishing is done by flying over the water, sighting a fish, then diving down to grab it out of the water.
- 4) Now both male and female walk around on the ground with wings out and lowered down and tail up.
- 5) Finally, the pair of birds will fly in a circle around each other.
- 6) While in the air, they will look for a place to build a nest. They must both agree on a site.
- 7) Then they land and build the nest, which consists merely of a layer of dry grass on the ground. Terns nest right on the ground, but in low spots if they can find them. (Use green yarn threads on the floor). Have both birds fly to get pieces of grass, then make them into a nest.
- 8) Add an egg to the nest. The mother starts out sitting on it. Then switch, with the father sitting on the egg. Switch two more times. The bird not on the nest may go out and fish for food for itself. You may want to discuss why the egg is mottled in color. Is this a good camouflage for ground nests?
- 9) Replace the egg with a chick. (Real tern eggs hatch in 22-27 days.) Does the chick look anything like the egg? Why? (Tern chicks are neither helpless like robins, nor totally independent like chickens. Helpless chicks are called “altricial” and fully developed chicks are called “precocial.” Terns are somewhere in between.)
- 10) The father goes out and gets fish for chick while mother sits on the chick. Then the father sits on chick while mother goes out and gets fish. Then switch one more time and have the father go out and get fish again. (Tern males do more fishing for the chicks than the females do.)
- 11) Now it is 10 days later. The chick starts walking around outside the nest. It does not need to be sat on any more. The tern chick matures very quickly, even compared to other birds. In just a few months it goes from hatching to flying across the world!
- 12) Now the chick is two months old. Replace small chick with full-grown bird. The parents show it how to dive for fish.

- 13) It is time to start migrating south. All terns will now go on a long flight. Players hold their birds up in the air and move them up and down to make the wings go. You may want to take a little time right now to “re-set” the room and put all the fish back in the middle, and clean up the nests. (If you have two adults leading the game, you could have one of them do the re-set while the other takes the birds on their flight.) In follow-the-leader style, the adult or teacher leads the flock of terns on a flight. If you can leave the room and go up and down a hall a few times, that is best. If not, you can circle around the room multiple times until the players feel they have flown a long distance.
- 14) (IF YOU ARE PRESSED FOR TIME, YOU COULD ELIMINATE THIS STEP AND GO TO NUMBER 16.) Finally, the lead tern stops. Now you need to show the players where they are on the map. Put a mark somewhere along the Tropic of Cancer latitude line. You might want to choose a location the students would be familiar with such as California or Spain. Tell the students they have just flown over 2000 miles. Do some fishing during this time. Remind students that in real life the terns make many more stops than in this simulation game. Real terns cannot fly 2000 miles without a rest. However, they could clock an impressive 100 miles in a day if they needed to!
- 15) Ready to move on again. Go for another long flight.
- 16) Stop for a rest and check progress on the map. You will now put a mark somewhere along the equator (if you are flying along the west coast of the Americas, stop at the Galapagos). Remind students they have just flown another 2000 miles. During this rest break discuss the shape of the tern’s wing. Show the visual aid that has drawings of four different types of bird wings and what each one is good for. Are the tern’s wings exactly like one of these wings, or is it sort of a combination of two of them? Why would this combination be good for the tern?
- 17) Go on another long flight.
- 18) (NOTE: IF YOU ARE PRESSED FOR TIME, YOU COULD ELINATE THIS STEP AND PICK UP WITH 20.) When you come back this time, you will put a mark on the map somewhere within the vicinity of the Tropic of Capricorn latitude line. Fish some more. During this break, look at the dashed lines on the world map. These show other migration routes of terns. They are a world-wide species. Do terns ever fly over land? Why not? At which two times of the year are terns near the equator?
- 19) Go on one last long flight.
- 20) Now put a mark where your migration route hits Antarctic. The Antarctic waters are famous for their abundance of fish and krill. Have the birds go out and dive for krill. You may make the return journey if you wish, or you may end the game here and leave the terns in Antarctica for the southern summer. (You could make it in one very long trip, if you remind the students that real terns would stop along the way to eat and rest.)



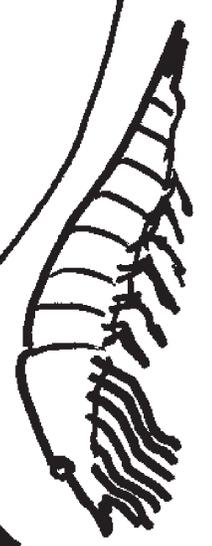
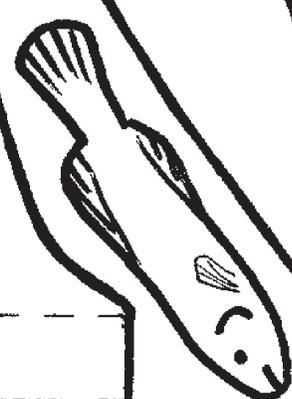
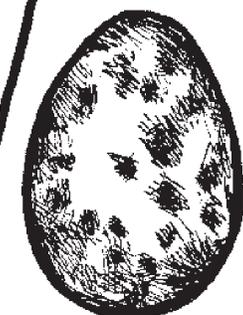
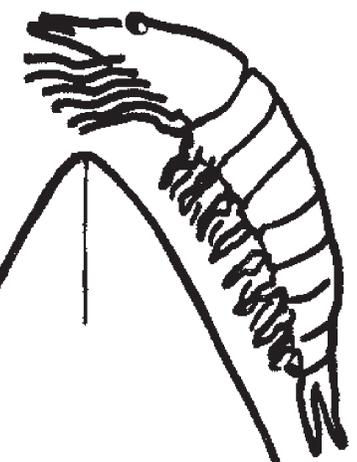
To fold here  
to make  
stick up

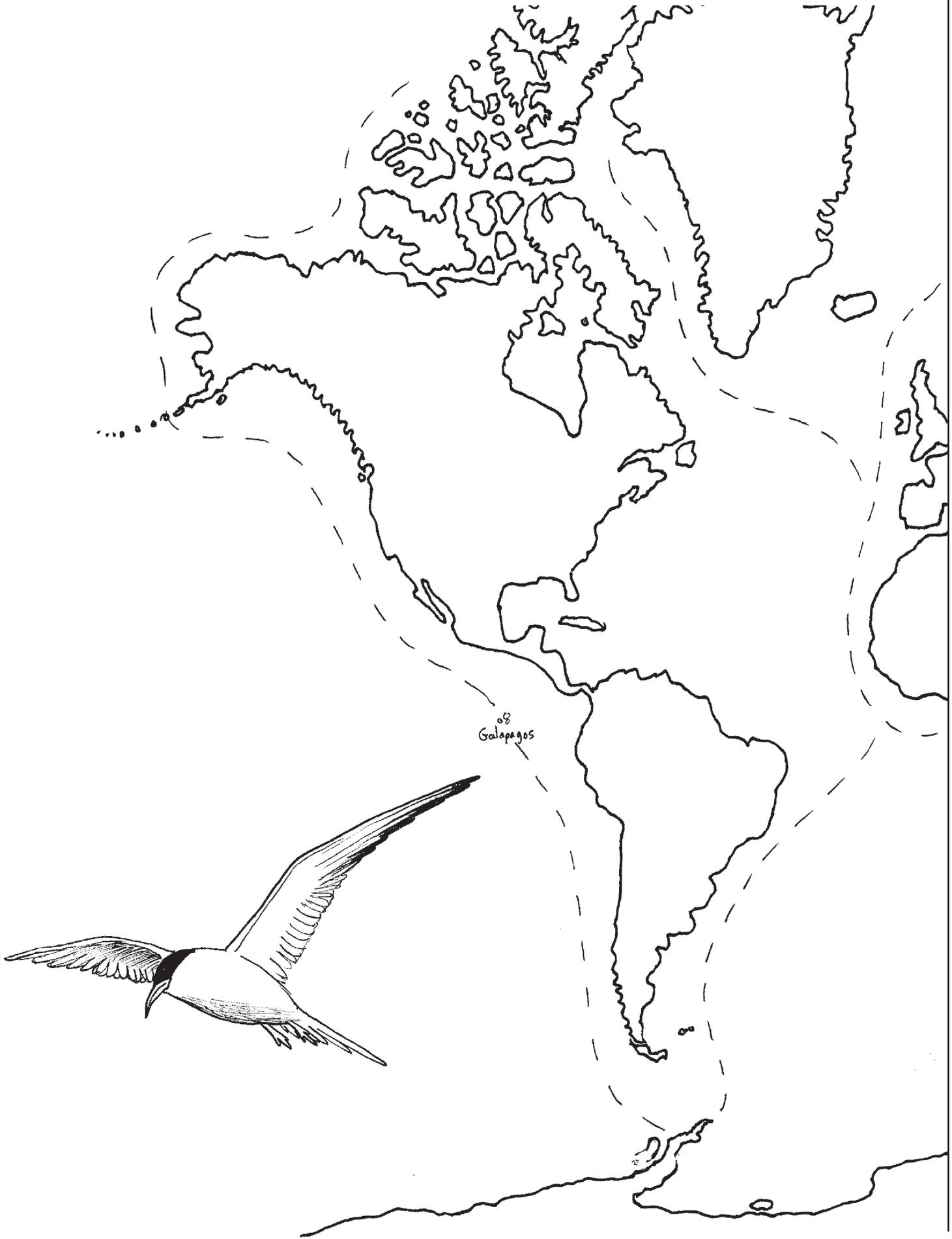
fold this  
over

glue wing here

tape leg here

To glue to other  
side of head





Galapagos

