

Creature Feature

Why are horseshoe crabs ideal estuary residents?

FOCUS: The horseshoe crab is an important and fascinating resident of Great Bay. This activity introduces students to a pre-historic animal species that has survived millions of years unchanged. This hardy animal is well-adapted to the changing conditions of the estuary.

Background: *Limulus polyphemus*, the horseshoe crab, has been called a living fossil. Unchanged for millions of years, it has no close living relatives. It is distantly related to spiders and scorpions, rather than to the crabs, as its name suggests.

It plows up sea worms and baby clams with the front of its shell and eats them as it walks (because its legs are attached to its mouth). It has been blamed unjustly for a decrease in clams on certain mudflats, and in earlier years was nearly exterminated for that reason. Now its importance in detecting endotoxins, disease-causing bacteria in humans, has given it, literally, new life.

Horseshoe crabs visit Great Bay from May through June to lay their eggs on the shore. The larger female drags one or more males up onto the beach. The eggs are an important food source for migrating shorebirds.

The empty shells you find on the shore are the molts, or cast-off shells. The front of the shell cracks and the animal crawls out. A new, soft shell underneath takes up sea water, expands and then hardens to create a bigger shell.

The horseshoe crab's range extends from the Caribbean to Maine. Since Great Bay is near the northern end of their range, they don't tend to be as numerous or grow as large here as in southern, warmer waters.

PRIMARY

SUPPLIES:

- "Creature Feature" from Treasures: A Children's Guide to Great Bay
- horseshoe crab molt (or live horseshoe crab, if available)
- paper plates
- horseshoe crab template
- crayons
- scissors
- glue
- stapler
- brass fastener

1. Read "Creature Feature" from Treasures: A Children's Guide to Great Bay
2. Examine horseshoe crab molt (gently) and ask: Why do you think people were afraid of this animal? What is its tail for? (turning over, steering when swimming, male hold on to female's tail to get a ride up the beach)
3. What do horseshoe crabs eat? (They bulldoze up mud with the front of their shells to find worms, baby clams. Other animals eat horseshoe crab eggs that they lay on the shore of the estuary in late spring and early summer).
4. To make a horseshoe crab puppet:
 - a. Color parts on template
 - b. Cut out pieces
 - c. Glue them onto "shell" made of two paper plates stapled together.
 - d. Fasten tail to "shell" with brass fastener.

INTERMEDIATE

SUPPLIES:

- patterns for horseshoe crab puppet (supplied)
- scissors
- glue
- crayons
- brass fastener

1. Using horseshoe crab hand puppet template pieces, trace parts onto colored construction paper.
2. Glue two sets of walking legs in middle of bottom shell with mouth between the legs.
3. Below that, glue five overlapping "book gills."
4. Cut holes for fingers.
5. Glue eyes onto top shell.
6. Glue rounded edges of top and bottom body parts together.
7. Leave back of shells open to insert your hand to hold puppet.
8. Fasten telson (tail) to rear of top shell with paper fastener.

From Science and Children, April, 1989.
Shared by Margo Kleinfelder, Monroe, NH

ADVANCED

SUPPLIES:

- Good Morning America news clip video (borrow from Sandy Point Discovery Center)
- Marine Resources of Great Bay NERR: Horseshoe Crab
- molt

1. Watch the short video on horseshoe crabs from Good Morning America or read Marine Resources of Great Bay NERR: Horseshoe Crab.
2. Discuss why horseshoe crabs are important now.
3. Can you think of any other animals that many people don't like? (sharks, snakes, spiders, bats, etc.)
4. Can you think of ways these animals are important to people? (bats and spiders eat insects, shark research may help us find a cure for cancer, etc.)
5. How are they important to the environment? (sharks eat diseased and dying fishes, help clean up ocean, all are part of food chain, etc.)
6. Create a poster to convince others that one of these maligned animals is important. Examine a horseshoe crab molt or diagram and label parts.

FURTHER EXPLORATIONS

1. WHAT GOOD ARE THEY? POEM BY JOHN STENGER

*Who'd write a poem about the horseshoe crab
Lying on the beach so dull and so drab?
Sure they've been around for 200 million years
and when we're extinct they'll shed no tears.
What good are these creatures in armor of brown
When they clutter the beaches of our coastal towns?
Why, as caviar their eggs serve birds and small fish
And small fish feed big fish that make us a dish.
So if *Limulus polyphemus* you meet once again
Remember they're links in the ocean food chain.*

2. THE VALUABLE "PEST"

At one time, horseshoe crabs were considered pests. But, they have always served various human uses. (Blue blood for medicine; shells for fertilizers in the past; Indians used shells as boat bailers and tails for spear tips for catching fish.) Their eggs are an important part of the food chain in the estuary, and horseshoe crabs eat dead and decaying things off the mudflats--as garbage collectors of the estuary. Discuss ways that the horseshoe crab is/has been valuable.

3. SEA POEMS

Look for other poems about sea creatures. See Ogden Nash, Alfred Lord Tennyson, others.

Directions

HORSESHOE CRAB PUPPET

Cut out pattern pieces. Numbers on pieces correspond to how many you need of each traced onto colored construction paper.

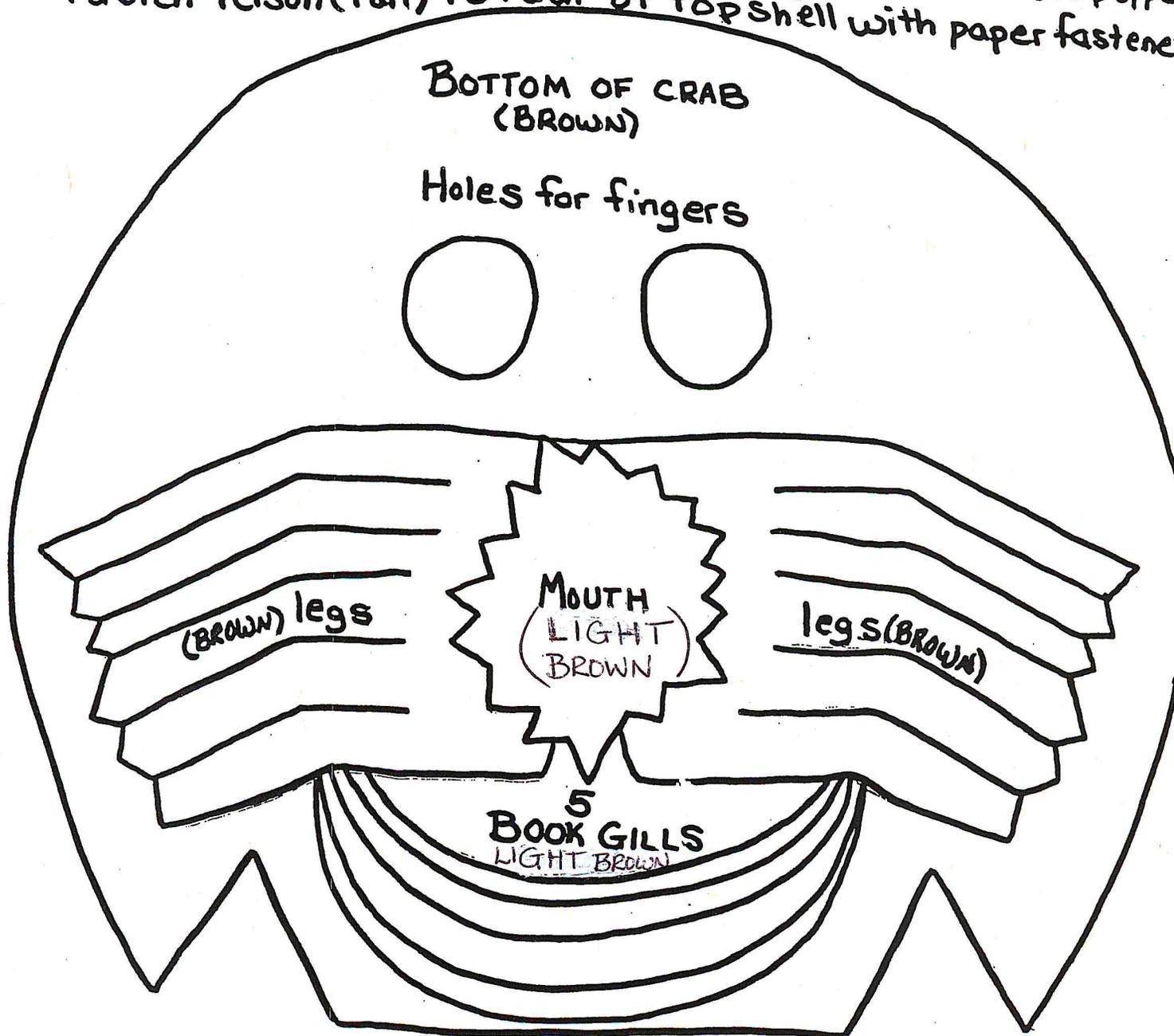
Glue 5 book gills, 2 sets of legs and a mouth on bottom of crab as shown below.

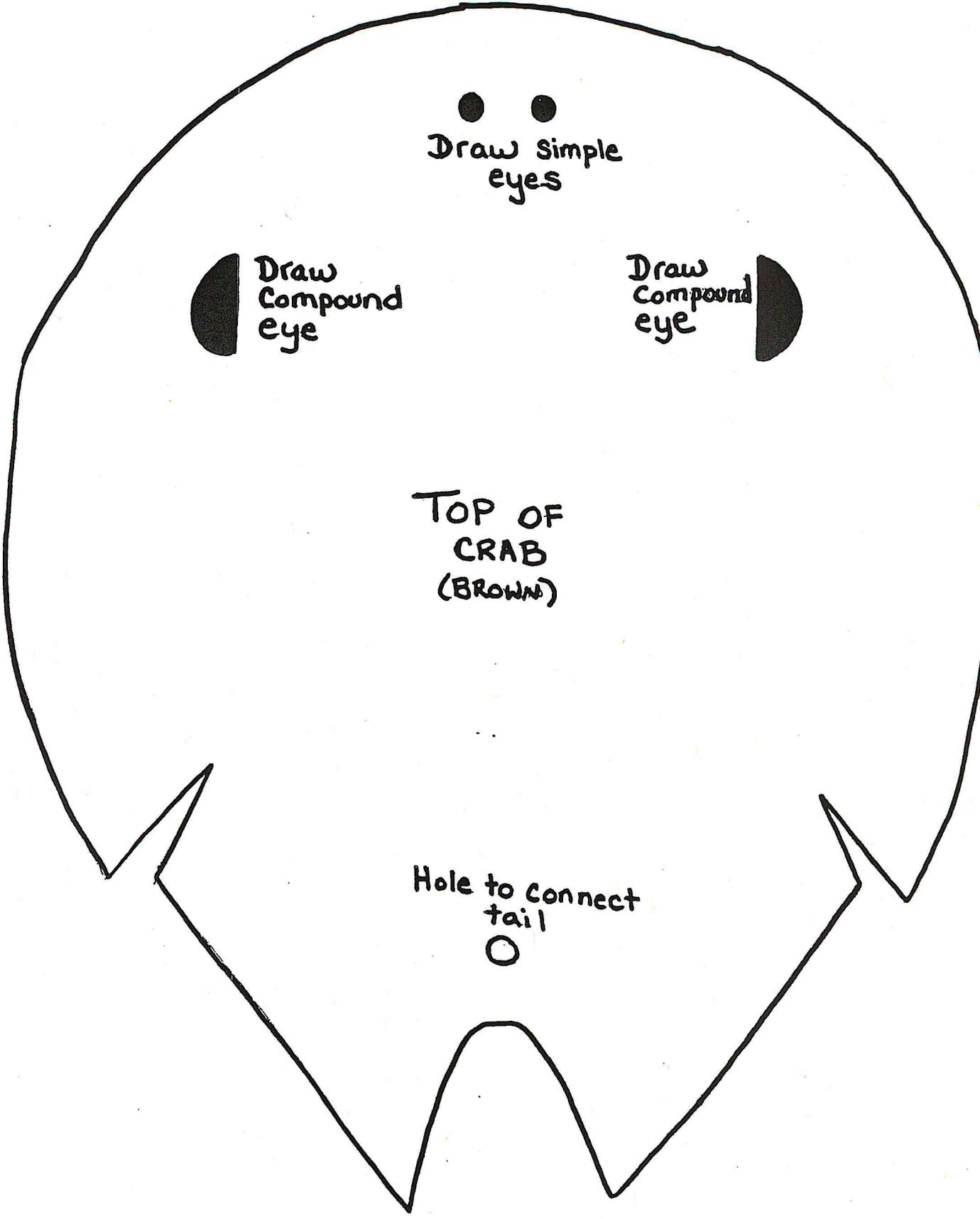
Cut holes for fingers. Draw simple and compound eyes on top shell as shown.

Glue rounded edges of top and bottom shells together.

Leave back of shells open to insert your hand to hold puppet.

Fasten telson (tail) to rear of top shell with paper fasteners.





● ●
Draw simple eyes

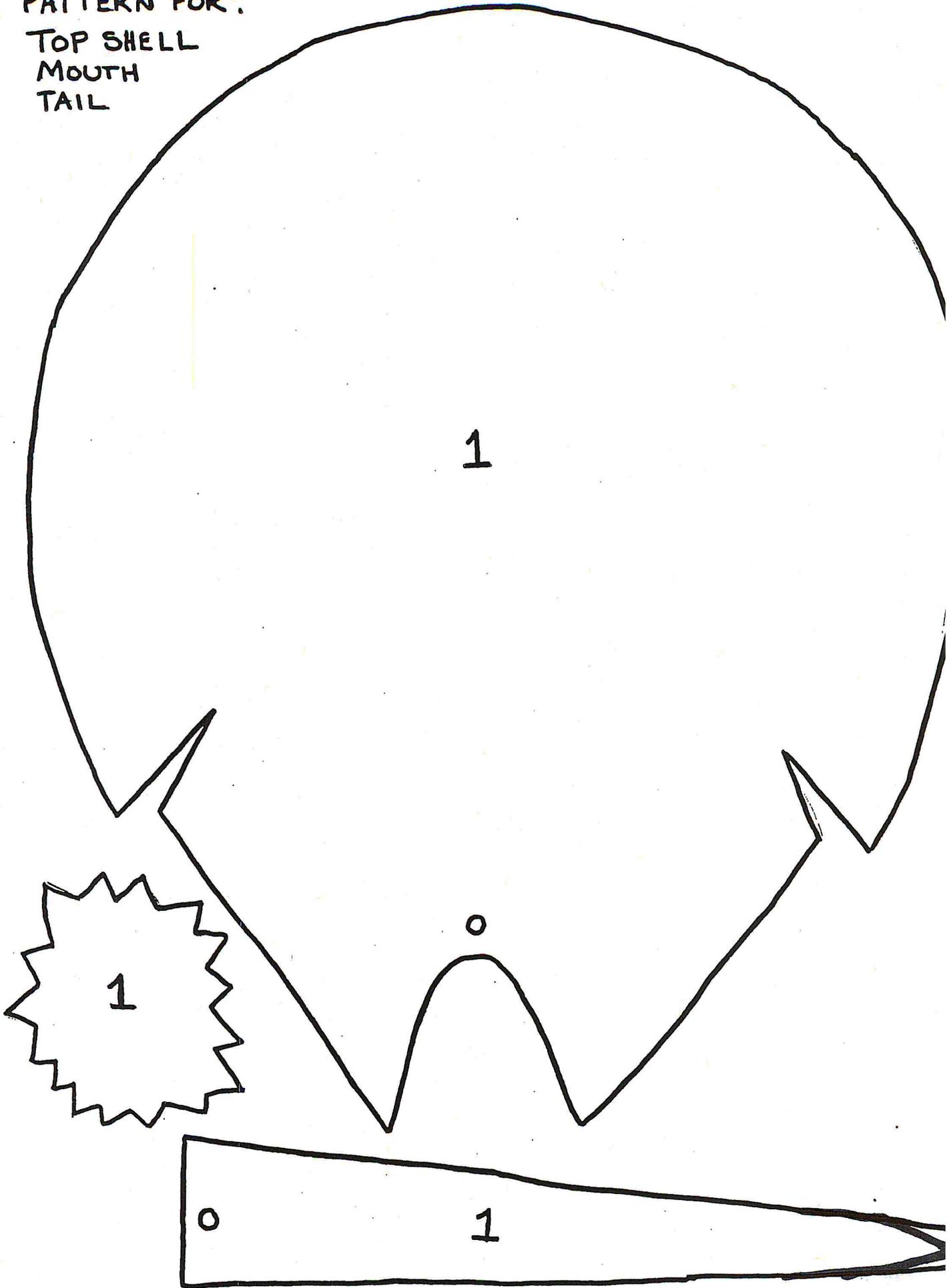
◐ Draw Compound eye

◑ Draw Compound eye

TOP OF CRAB (BROWN)

Hole to connect tail
○

PATTERN FOR:
TOP SHELL
MOUTH
TAIL



PATTERN FOR: 3"
BOTTOM SHELL
BOOK GILLS
LEGS

