Tide Pool Patterns

Use planes of symmetry to compare animal body plans.

ZOO.2.1 "Differentiate among asymmetry, radial symmetry, and bilateral symmetry in an animal's body plan."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the three rules for planes of symmetry, then circle clues about each animal's body plan and write A, R, or B beside its name to show which rule fits.

Who Matches Whom?

1. At low tide, a rocky pool becomes a gallery of body plans. To compare animals, imagine a plane passing through the body, not just a line across its surface. A plane of symmetry divides a body into two matching halves. An asymmetrical body has no such plane. A radially symmetrical body has several planes that pass through a central axis and make matching halves. A bilaterally symmetrical body has just one plane that makes left and right mirror halves. Ignore color patches and small injuries when judging the basic arrangement of body parts.

2. An encrusting sponge spreads over one side of a rock. Its outline twists around bumps, and its openings occur in uneven places. No central axis organizes its outer shape, and no imagined plane would split this particular sponge into matching halves. Nearby, a sea anemone grips a flat stone. Its tentacles repeat around a central mouth like petals around a flower's center. Imagine cutting through its mouth and down its central axis at different angles. Several of those planes would divide its basic body plan into matching halves, even if individual tentacles bend.

3. Farther out, an adult sea star creeps across sand on five arms arranged around a central disk. Each arm repeats the same basic structure. Planes passing through the disk and along particular arms can divide the sea star's basic form into matching halves. A crab beside it moves on paired legs attached to opposite sides of its body. One plane through the crab from front to back divides its basic form into left and right mirror halves. A plane from side to side would put its eyes and mouth in one half and its rear in the other.

2 ANSWER WITH EVIDENCE

Use the passage

1. How do the sponge and sea anemone differ in symmetry? Use a clue about each animal's body plan.

2. The sea anemone has tentacles, while the adult sea star has arms. Why do they have the same type of symmetry?

3. Which type of symmetry does the crab have? Explain why a plane from side to side does not make matching halves.

4. Neither the sponge nor the crab has several planes of symmetry. What difference between their body plans makes them different types?

3 YOUR TURN

Your own words

Invent three imaginary animals, one with each type of symmetry. Describe where each animal's parts are placed and explain how many planes would divide each body into matching halves.

ANSWER KEY

Tide Pool Patterns

PART 1 · READ AND MARK

Underline the three rules for planes of symmetry, then circle clues about each animal's body plan and write A, R, or B beside its name to show which rule fits. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How do the sponge and sea anemone differ in symmetry? Use a clue about each animal's body plan.	**This sponge is asymmetrical because no plane divides it into matching halves. The sea anemone is radially symmetrical because several planes through its central axis do.**
2	The sea anemone has tentacles, while the adult sea star has arms. Why do they have the same type of symmetry?	**Both have repeated parts around a center, so several planes through their central axes make matching halves.**
3	Which type of symmetry does the crab have? Explain why a plane from side to side does not make matching halves.	**The crab has bilateral symmetry. A side-to-side plane separates its front, with its eyes and mouth, from its rear, so those halves do not match.**
4	Neither the sponge nor the crab has several planes of symmetry. What difference between their body plans makes them different types?	**The crab has one plane that makes matching left and right halves. This sponge has no plane that makes matching halves.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Kinkfin is asymmetrical: it has a bent trunk, one large fin near its head, and two different fins near its tail, so no plane makes matching halves. Wheelworm is radially symmetrical: eight identical paddles are evenly spaced around its central mouth, allowing several planes through its central axis to make matching halves. Twinleg is bilaterally symmetrical: it has a head at the front, a tail at the back, and matching legs on its left and right sides, allowing one plane to make matching halves.

Accept explanations based on the arrangement of body parts and the number of planes that make matching halves. For Part 3, invented animals may have any features consistent with their stated symmetry.