Built for Balance

Primate traits and the mechanics of walking upright

ZOO.10.4 "Describe characteristics that make primates unique, including investigating how the center of gravity relates to the evolution of bipedalism."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Circle two primate traits that help with grasping or judging distance. Underline the sentence that explains how body structure helps keep the center of gravity over a supporting foot.

From Grasping to Walking

1. Imagine watching a chimpanzee reach for fruit while a person picks up an apple. Both can wrap fingers around an object and use sensitive fingertips to judge its shape. Their forward-facing eyes provide overlapping views that help them judge distance. Like other primates, they have nails on most digits rather than claws, and relatively mobile shoulders. No single trait on this list belongs only to primates. Together, these traits support grasping, careful movement, and close inspection of objects. Primates vary, however: not every species grips or moves in exactly the same way.

2. Now picture the person taking a slow step. Gravity acts as if the body's weight were concentrated at its center of gravity, located near the pelvis in an upright adult. During one-leg balance, shifting weight toward the supporting foot helps keep that center above the foot's area of contact with the ground. A short, broad pelvis supports muscles that steady the trunk, while inward-angled thigh bones place the knees and feet closer beneath the body. These structures make balancing on one leg during walking less demanding.

3. A chimpanzee can also walk on two legs, but its usual movement includes climbing and walking on all fours. When a chimp walks upright, its center of gravity is harder to keep over one supporting foot, so it often sways its trunk from side to side and bends its hips and knees. Fossil pelvis and leg bones indicate that some early human relatives gradually evolved structures suited to frequent upright walking. Those changes likely improved balance during steps, but fossils alone cannot tell us every reason bipedalism evolved. Human bipedalism is not the same as simply standing up once.

2 ANSWER WITH EVIDENCE

Use the passage

1. Describe two primate traits in the passage and explain how each helps a primate interact with objects.

2. During one-leg balance, why does a person shift weight toward the supporting foot?

3. How do the human pelvis and thigh bones each help with balance during a step?

4. How does a chimpanzee often adjust its body when walking upright, and what balance problem do those movements address?

3 YOUR TURN

Your own words

An extinct primate had a short, broad pelvis, but its thigh bones did not angle inward. In four sentences, predict one advantage and one challenge it might have during upright walking, explain how it might balance over a supporting foot, and name one thing these bones cannot establish.

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PART 1 · READ AND MARK

Circle two primate traits that help with grasping or judging distance. Underline the sentence that explains how body structure helps keep the center of gravity over a supporting foot. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Describe two primate traits in the passage and explain how each helps a primate interact with objects.	**Sensitive fingertips help judge an object's shape, and forward-facing eyes help judge its distance.**
2	During one-leg balance, why does a person shift weight toward the supporting foot?	**The shift helps keep the center of gravity above the foot's area of contact with the ground.**
3	How do the human pelvis and thigh bones each help with balance during a step?	**A short, broad pelvis supports muscles that steady the trunk. Inward-angled thigh bones place the knees and feet closer beneath the body.**
4	How does a chimpanzee often adjust its body when walking upright, and what balance problem do those movements address?	**It often sways its trunk and bends its hips and knees, which helps it manage the difficulty of keeping its center of gravity over one supporting foot.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

A short, broad pelvis could support muscles that steady this primate's trunk during upright walking. Without inward-angled thigh bones, its feet might sit farther from its midline, making one-leg balance harder. It might shift its trunk to keep its center of gravity over the supporting foot. These bones alone cannot establish why its lineage evolved any upright walking.

Accept other passage-supported traits and functions in Question 1. For the open task, look for a cautious prediction that connects both bone features to balance and identifies a limit of fossil evidence.