

**INVESTIGATION QUESTION**

How does the concept of ecological opportunity explain the rapid diversification of mammals after the K-Pg extinction, and what specific body changes does each new niche require?

**THE ANCESTOR**

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*Small, shrew-like early Paleocene mammal*  
Size of a mouse | Warm-blooded  
Flexible diet | Can burrow and climb

*For each niche below, describe the body changes needed, find a real Cenozoic mammal that filled it, and note approximately how long after the extinction that mammal appeared.*

← **THE BURROWER**  
*Underground | roots, worms, soil insects*

**THE SWIMMER** →  
*Water | fish or aquatic plants*

← **THE GLIDER**  
*Trees | air travel | insects or fruit*

**THE LARGE GRAZER** →  
*Open plains | grasses and low plants*

← **THE INSECT EATER**  
*Specialized insect hunter | possibly nocturnal*

**THE FRUIT EATER** →  
*Forest canopy | fruit, leaves, grasping hands*

**NICHE 1: THE BURROWER**

**THE BURROWER** — *Lives underground, eats roots, worms, and soil insects*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

**NICHE 2: THE SWIMMER**

**THE SWIMMER** — *Lives in or near water, eats fish or aquatic plants*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

### NICHE 3: THE GLIDER

**THE GLIDER** — *Lives in trees, moves through the air, eats insects or fruit*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

### NICHE 4: THE LARGE GRAZER

**THE LARGE GRAZER** — *Lives on open plains, eats grasses and low plants*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

### NICHE 5: THE INSECT EATER

**THE INSECT EATER** — *Highly specialized for catching insects, possibly nocturnal*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

### NICHE 6: THE FRUIT EATER

**THE FRUIT EATER** — *Lives in forest canopy, eats fruit and leaves, needs grasping hands*

Body changes needed: \_\_\_\_\_

Real Cenozoic mammal that filled this niche: \_\_\_\_\_

Approx. how long after extinction did it appear? \_\_\_\_\_

**ANALYSIS**

*Which niche required the most dramatic body changes from the ancestor? Which required the least? What does that tell you about how far evolution can push a body plan when the right conditions exist?*

**CONCLUSION**

*Explain in your own words what adaptive radiation is and why the K-Pg extinction created the conditions for it. Why was the ancestor's generalist nature an advantage rather than a disadvantage in the post-extinction world?*

**CONNECT IT**

*Marsupials are found mostly in Australia today because continental drift isolated that landmass before placental mammals could reach it. Research when Australia separated from other landmasses and what happened to its mammal populations after that separation. What does the Australian mammal fossil record tell us about what happens when evolution runs in isolation?*

**THINK FURTHER**

*True large mammals do not appear in the fossil record until roughly 10 million years after the K-Pg extinction. Research what scientists think explains that gap. Why did it take so long for mammals to grow big, even though the large predator and large grazer niches were immediately available?*