Build for Turtles

Use habitat needs and test results to guide a design

ZOO.1.6 "Enrichment: Use an engineering design process to develop an artificial habitat to meet the requirements of a population that has been impacted by human activity.*"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the turtles' habitat needs, circle the project limits, and number the steps the team uses to test and improve its design.

A New Place for Painted Turtles

1. A road project filled a shallow wetland used by twelve painted turtles. With wildlife officials' approval, a rehabilitation center will house the turtles while a permanent wetland is restored. The center has a sunny 20-by-15-meter plot and a $2,500 construction limit. Painted turtles need water for swimming and feeding, dry places to bask, and sunny ground where females can dig nests. They also need places to hide from predators. A design that provides water but no nesting ground would not support the population's full life cycle. Staff must also prevent turtles from reaching the nearby road.

2. One team proposes a lined pond with shallow shelves, deeper water, native water plants, and several anchored basking logs. A sandy, sunny bank beside the pond provides nesting ground. A low fence encloses both pond and bank, with a gate for staff; its lower edge is buried so turtles cannot crawl beneath it. The team rejects a bare concrete pool because it lacks nesting ground and places to hide. The proposed pond fits the plot, but the team still has to price materials and check whether its size gives twelve turtles enough room.

3. Before construction, the team builds a small model to check whether rainwater would drain toward the nesting bank. It also estimates costs from local prices. After building the habitat, staff record water depth, count turtles using the basking logs, and watch for crowding and attempts to cross the fence. They check the sandy bank for nests during nesting season without disturbing them. If heavy rain floods the bank, the team can raise the bank and retest drainage. If turtles cluster on one log while others are unused, staff can change log positions before deciding whether more logs are needed.

2 ANSWER WITH EVIDENCE

Use the passage

1. Which two features of the proposed habitat meet different turtle needs? Explain what each feature provides.

2. What design choice keeps turtles from reaching the road? What detail makes it more effective?

3. Why does the team reject a bare concrete pool, even if it holds water?

4. If heavy rain floods the nesting bank, how should the team change the design, and what should it test afterward?

3 YOUR TURN

Your own words

A new building shades the nesting bank, but one corner of the plot still gets direct sun. In four sentences, propose a change that stays within the plot and budget, explain how it meets a turtle need, describe one trade-off, and state how staff could test whether it works.

ANSWER KEY

Build for Turtles

PART 1 · READ AND MARK

Underline the turtles' habitat needs, circle the project limits, and number the steps the team uses to test and improve its design. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Which two features of the proposed habitat meet different turtle needs? Explain what each feature provides.	**For example, the pond provides water for swimming and feeding, while the sandy, sunny bank provides nesting ground.**
2	What design choice keeps turtles from reaching the road? What detail makes it more effective?	**A fence encloses the habitat. Its buried lower edge prevents turtles from crawling beneath it.**
3	Why does the team reject a bare concrete pool, even if it holds water?	**It does not provide nesting ground or places to hide, so water alone would not meet the turtles' needs.**
4	If heavy rain floods the nesting bank, how should the team change the design, and what should it test afterward?	**Raise the bank, then retest whether rainwater drains toward it.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

I would move the sandy bank to the sunny corner inside the fence, reuse its sand, and check labor costs to keep the work within the $2,500 budget. This spot would give females sunny ground where they can dig nests. Moving the bank would leave less space for plants, so I would protect the pond's planted shelves. Staff could measure hours of direct sunlight at the new bank and check for nests during nesting season without disturbing them.

Accept other supported feature-and-need pairs in question 1. For the open task, accept a feasible change that addresses nesting conditions, acknowledges a trade-off, and includes a relevant test.