

## Design Worksheet **Answer Key**

### Rocket Fins

1. Rockets and arrows always have fins (or feathers) at the tail end.  
Why do you think this is so? What are the fins for?

The fins (or feathers) make the rockets and arrows more stable during flight and maintain their direction.

2. How do you think the fins work? Write a very brief explanation.

The fins counteract sideways motion of the rocket. When air hits the fins, it pushes the rocket in a straight motion; the center of drag follows the center of mass.

### Rocket Design: Weight and Propellant

3. In the “design matrix” below, circle the design you think will make the rocket fly STRAIGHT and FAR.

Propellant→	Air (A)	Water (W)
High Center of Mass (H)	AH	<b>WH</b>
Low Center of Mass (L)	AL	WL

### Justification: Why did you choose this design?

4. The rocket should have a high center of mass because:

The center of mass is the pivot point of the rocket. By having it located higher on the rocket, it creates a separation between the center of mass and center of drag for better stability.

5. Using water as propellant will make the rocket go further because:

Water has a higher mass than the rocket and air, so it propels the rocket further because it can generate more thrust (conservation of momentum).