

# FORCE FRENZY

A Grade 5 Energy Board Game

## Set Up Information:

- Players: 2-6
- Time: 20-30 Minutes
- Print out board games and cards
- Dice
- 1 marker/token per player
- 1 KEY page per game

**Goal:** Be the first person to reach the finish bubble on the game board.

## How To Play:

1. Place all player tokens on START
2. Shuffle each deck of cards and place face down on the 'Card Mat'
  - i. AIR FORCES cards are played when on the brown circles (air path) on the board
  - ii. WATER FORCES cards are played when on the green circles (water path) on the board
3. Roll the dice and move your marker/token the same number of spaces
4. Draw the correct card (see step 2). Read the card aloud and answer its question. Another player can check answer to Questions are found on the page entitled "KEY". If answered correctly, move ahead 2 spaces. If wrong, move back one spot.
5. Challenge bubbles: If you land on the challenge spot, inform your teacher! They will have a simple hands on activity for you do.

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TEACHER ONLY  
PAGE

## Challenge Cards:

When Students land on the CHALLENGE spot, they are to tell the teacher. These are HANDS ON opportunities that the teacher will lead. There are only 2 challenge spots on the board, so it won't happen very often.

- **Challenge 1: Air Resistance Test**

- *Wave a flat sheet vs. scrunched paper. Which has more drag?*
- Correct Answer: Flat sheet.
- Move: +3 spaces if correct! Stay on spot if not correct

- **Challenge 2: Buoyancy Guess**

- *Predict which classroom object will float or sink (teacher chooses).*
- Move: +3 spaces if correct! Stay on spot if not correct

- **Challenge 3: Thrust Simulation**

- *Use your hand to push water in a cup forward. What direction does the cup move?*
- Correct Answer: Opposite direction of the push (Newton's 3rd law).
- Move: +3 spaces if correct! Stay on spot if not correct

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Name: \_\_\_\_\_

Class: \_\_\_\_\_

## **Part 1: Game Experience**

1. What was your favourite part of the game? Why?

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2. What was the most challenging part of the game?

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## **Part 2: Understanding the Forces**

Choose one example from the Air Path and one from the Water Path in the game. For each, describe what happened and what forces were acting.

- **Air Example:**

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What forces did you observe (e.g, lift, gravity, drag, thrust)?

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- **Water Example:**

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What forces did you observe (e.g, buoyancy, water resistance, thrust)?

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## **Comparing Air and Water**

How were the forces acting on living things and objects similar and different in air vs. water?

Similarities: \_\_\_\_\_

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Differences: \_\_\_\_\_

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## Part 3: Reflection

Based on this board game and what you have learned in class, compare how forces affect living things and objects in water and air. Tell me everything you know on the topic.



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**AIR FORCE CARD**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

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**AIR FORCE CARD**

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**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**

A1.

A small plane speeds up as it takes off. Which force must be stronger: thrust or drag?

**FORCE**  
**FRENZY**

A2.

A glider slows down in the air. Which force is acting against its motion?

**FORCE**  
**FRENZY**

A3.

A hawk spreads its wings wide to rise higher in the sky. Which force must be greater than weight?

**FORCE**  
**FRENZY**

A4.

A parachute opens and the person begins to fall more slowly. What downward force is still acting on them?

**FORCE**  
**FRENZY**

A5.

A bee hovers in one place. What upward force is helping stay in the air?

**FORCE**  
**FRENZY**

A6.

A drone climbs straight upward. What force must be increased for this to rise?

**FORCE**  
**FRENZY**

A7.

Birds have hollow bones. How does this help them with flight?

**FORCE**  
**FRENZY**

A8.

A fishing spear travels forward when it is thrown. What force moves it in the direction of the throw?

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
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**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**



**AIR FORCE CARD**

**FORCE**  
**FRENZY**

A9.

How do thrust and drag affect the speed of a flying object?

**FORCE**  
**FRENZY**

A10.

Why does an object sink when its weight is greater than the buoyant force?

**FORCE**  
**FRENZY**

A11.

What opposing force must lift overcome for an airplane to rise?

**FORCE**  
**FRENZY**

A12.

How does increasing the wing size change lift?

**FORCE**  
**FRENZY**

A13.

Why does a paper airplane dive downward when weight becomes stronger than lift?

**FORCE**  
**FRENZY**

A14.

What force pushes an arrow forward when launched from a bow?

**FORCE**  
**FRENZY**

A15.

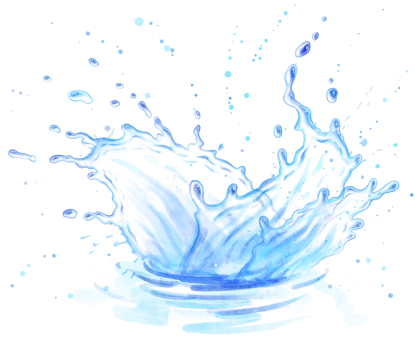
What does a slingshot stone eventually fall to the ground even if it starts with a lot of thrust?

**FORCE**  
**FRENZY**

A16.

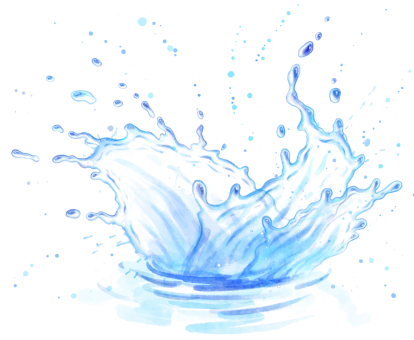
How does drag change when a bird tucks in its wings?

**FORCE**  
**FRENZY**



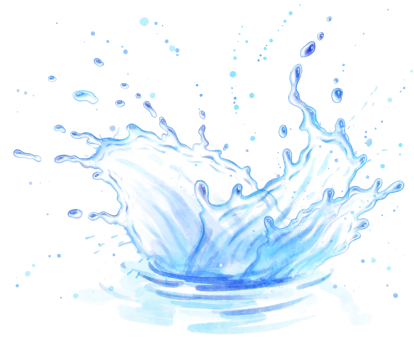
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



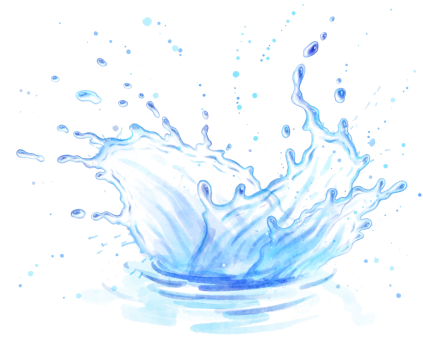
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



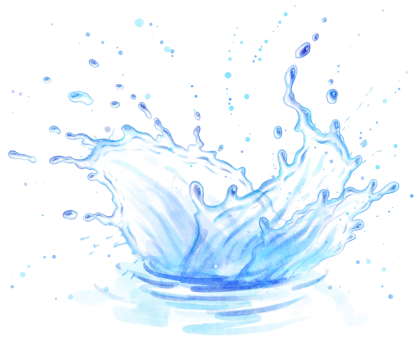
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**



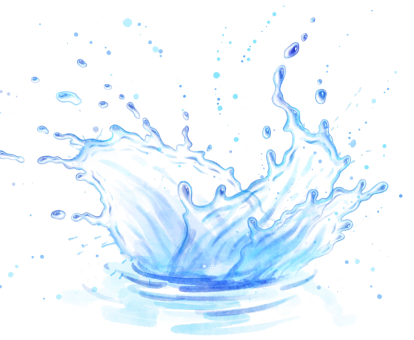
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**FORCE**  
**FRENZY**



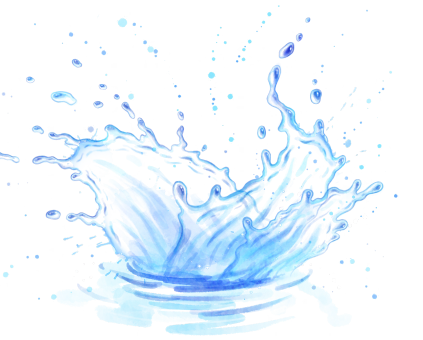
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**

W1.

a boat floats on the surface of a lake. What upward force is holding it up?

**FORCE**  
**FRENZY**

W2.

A rock sinks when dropped in water. Why does it sink?

**FORCE**  
**FRENZY**

W3.

A wooden block floats. Why is it able to float?

**FORCE**  
**FRENZY**

W4.

A swimmer feels it is harder to move quickly underwater. What force is slowing them down?

**FORCE**  
**FRENZY**

W5.

A fish moves forward by pushing water backward with its tail. What force pushes it forward?

**FORCE**  
**FRENZY**

W6.

A submarine sinks when water fills its ballast tanks. Which force becomes stronger: weight or buoyant force?

**FORCE**  
**FRENZY**

W7.

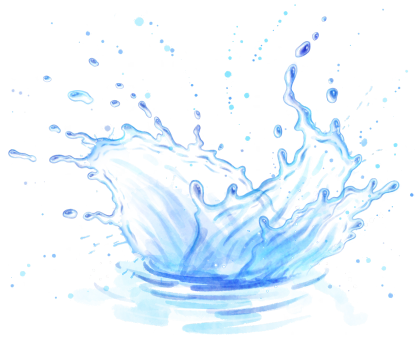
A shark does not have a swim bladder. What force is lower because of this?

**FORCE**  
**FRENZY**

W8.

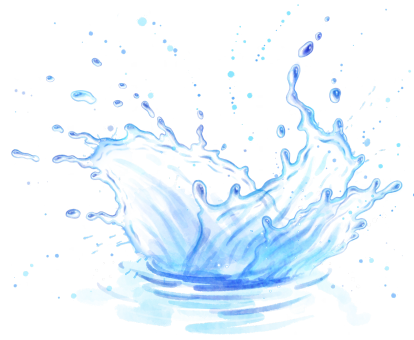
Sea otters trap air in their fur to stay warm and float. Which force helps them float?

**FORCE**  
**FRENZY**



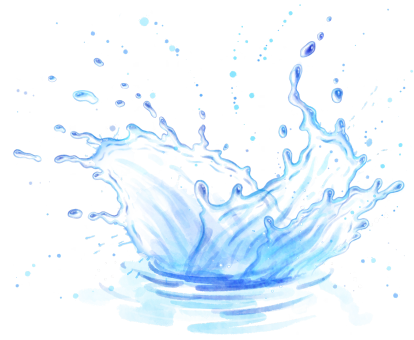
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



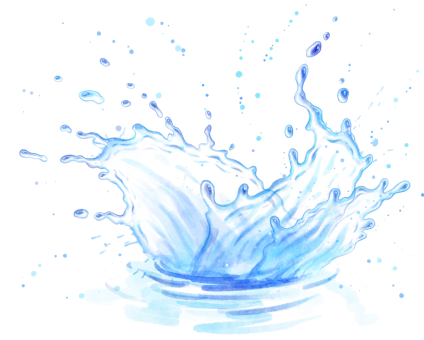
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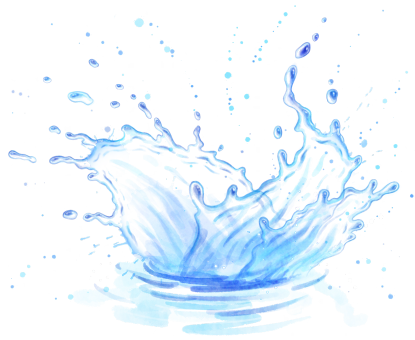
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**WATER FORCE CARD**

**FORCE**  
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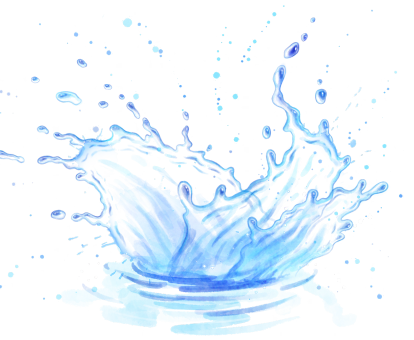
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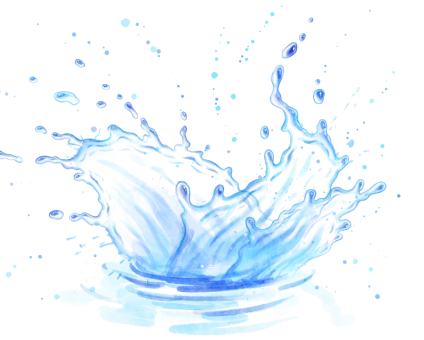
**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**



**WATER FORCE CARD**

**FORCE**  
**FRENZY**

W9.

What force helps a boat or floating log stay on the surface of the water?

**FORCE**  
**FRENZY**

W10.

Why does an object sink when its weight is greater than the buoyant force?

**FORCE**  
**FRENZY**

W11.

How does the buoyant force change when an object displaces more water?

**FORCE**  
**FRENZY**

W12.

Why do some fish rise in the water when they fill their swim bladder with gas?

**FORCE**  
**FRENZY**

W13.

How does the shape of a canoe reduce drag in water?

**FORCE**  
**FRENZY**

W14.

Explain when the traditional fishing spear has drag and thrust.

**FORCE**  
**FRENZY**

W15.

Why does a swimmer move faster when they push harder against the water?

**FORCE**  
**FRENZY**

W16.

Why is it easier to float in saltwater than freshwater?

# FORCE FRENZY

## Air Force Cards

## THE KEY

## Water Force Cards

**A1: Thrust**

**A2: Drag**

**A3: Lift**

**A4: Weight caused by gravity**

**A5: Lift**

**A6: Thrust**

**A7: Reduces Weight so Lift can overcome gravity**

**A8: Thrust**

**A9: More thrust increases speed; more drag  
decreases speed.**

**A10: Drag pushes backward, slowing the aircraft.**

**A11: Lift must overcome weight (gravity).**

**A12: Larger wings increase lift**

**A13: Weight becomes stronger than lift, pulling it down.**

**A14: Thrust from the stretched bowstring.**

**A15: Gravity (weight) pulls it downward once thrust  
decreases.**

**A16: Drag decreases because body is more streamlined.**

**W1: Buoyant force**

**W2: Weight is greater than buoyant force**

**W3: Buoyant force is greater than weight**

**W4: Drag (water resistance)**

**W5: Thrust**

**W6: Weight**

**W7: Buoyant force**

**W8: Buoyant force**

**W9: Buoyant force.**

**W10: Downward weight is stronger than the upward  
buoyant force.**

**W11: More water displaced = stronger buoyant force.**

**W12: The added gas increases buoyant force**

**W13: A narrow, smooth shape reduces water drag.**

**W14: Thrown with thrust, slowed by drag.**

**W15: More thrust from swimmer's push increases speed.**

**W16: Saltwater is denser, creating greater buoyant force.**