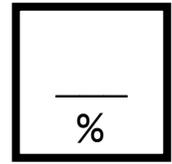


Flight Test



Name



Part A: Multiple Choice (___/3)

1. Choose the characteristic of birds that does not help them fly.

- Their bones are hollow and light.
- Their wings have large surface areas compared to their bodies.
- Their bodies are wedge-shaped.
- The colour of their feathers helps create lift.



2. Choose the characteristic of fish that does not help them swim through water.

- Their tail fins have colourful designs on them.
- Their bodies are wedge-shaped.
- They have a smooth body surface.
- Their fins provide thrust.



3. Choose the characteristic of insects that does not help them to fly:

- Their wings are generally larger than their bodies.
- They are very light.
- Their wings move very quickly to provide thrust.
- They are cold blooded.



Part B: Listing (___/5)

1. List three ways that air and water are alike.

- * They both have _____ and _____.
- * They both take the _____ of their container.
- * They both exert _____.
- * They both have the ability to _____.
- * They both take up _____.

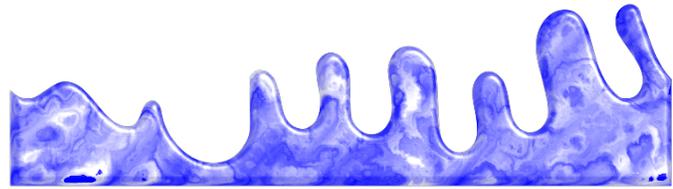


2. List two ways that air and water are different.

- * Water is _____ than air.
- * Water is more _____ than air.
- * Air tends to _____ while water tends to _____.
- * Water is a _____ while air is a _____.



Part B Continued: Listing (___/4)



3. List four properties of fluids.

- * Warm fluids are less _____ than colder fluids.
- * Fluids _____ when heated and _____ when cooled.
- * Fluids have _____ and weight.
- * Fluids take the shape of their _____.
- * Fluids have the ability to _____.
- * Fluids exert _____.
- * Warm fluids tend to _____ while cooler fluids tend to _____.
- * Fluids take up _____.

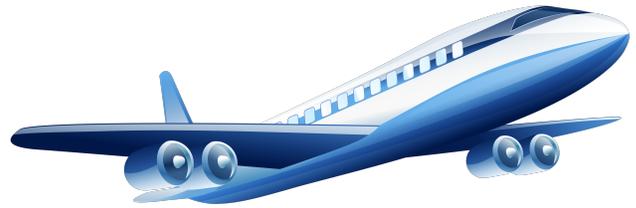
Part C: Matching (___/15)

a. aileron	d. elevator	g. pressure	j. buoyancy	m. expansion
b. roll	e. contraction	h. gravity	k. rudder	n. density
c. lift	f. thrust	i. drag	l. pitch	o. yaw

- ___ 1. The force that causes a less dense object to float in a more dense fluid
- ___ 2. The technical term that describes the turning of an aircraft to the left or right
- ___ 3. The plane's movement where one wing is pushed up while the other is pushed down
- ___ 4. The occurrence of a substance becoming larger
- ___ 5. The occurrence of a substance becoming smaller
- ___ 6. The mass of an object compared to its size
- ___ 7. The part of an airplane that causes the aircraft to go up and down
- ___ 8. The mechanical force that causes the plane to move forward
- ___ 9. The force that causes resistance to a plane when it travels through the air
- ___ 10. A force directed upon a surface. It is measured by weight per unit area.
- ___ 11. The force that causes an airplane to rise
- ___ 12. The force that causes objects to fall to the ground
- ___ 13. The part of an airplane that causes the aircraft to roll to one side or the other
- ___ 14. The technical term that describes the rising or the falling of an airplane
- ___ 15. The part of a plane that turns the aircraft to the left or the right



Part D: Fill In The Blank (___/16)



1. When air is _____ it expands.
2. When air is _____ it contracts.
3. When air expands it becomes less _____.
4. Warm air is _____ dense than cool air and therefore warm air _____.
5. To keep a hot air balloon hovering at a constant level the density of the balloon must be _____ to the density of the air.
6. Air moves _____ over a curved surface than over a flat surface and a _____ is created.
7. Fast moving air is _____ dense than slow moving air.
8. Slow moving air exerts _____ pressure than fast moving air
9. When _____ dense air pushes against a pocket of _____ dense air it moves in the opposite direction.
10. This happens because of the physical law that states, “ for every _____ there is an _____ and _____.

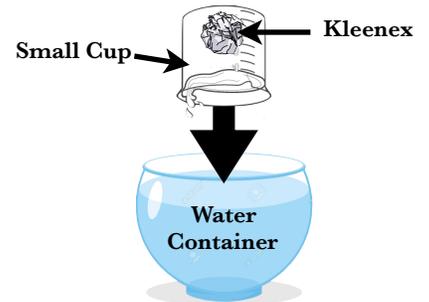


<u>Word List</u>				
* action	* cooled	* dense	* equal	* equal
* faster	* heated	* less	* less	* less
* more	* opposite	* reaction	* rises	* more
		* vacuum		

Part E: Short Answer Continued. Answer the following questions. (___ / 23)

1. A paper towel is placed at the bottom of a jar and the jar is placed upside down under the water? What will happen to the paper towel? Why will this happen?

Word List: space * wet * won't * air

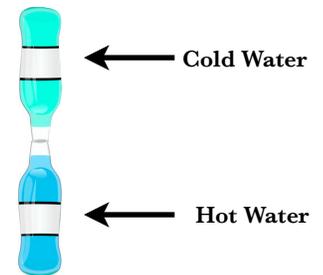


4

* The paper towel _____ get _____ because the _____ inside the container will take up _____.

2. The spout of an uncapped cold water bottle is placed directly on top of the spout of an uncapped hot water bottle. What will happen to the liquids and why?

Word List: rise * rises * dense * fall



4

* The hot water will _____ into the cold water bottle while the cold water will _____ into the hot water bottle. This happens because hot water is less _____ than cold water and, therefore, _____ above it.

3. You blow over the top of a strip of paper, as depicted in the diagram. What will happen to the paper strip and why?

Word List: dense * fall * opposite * more * upward * air * gravity * below * faster

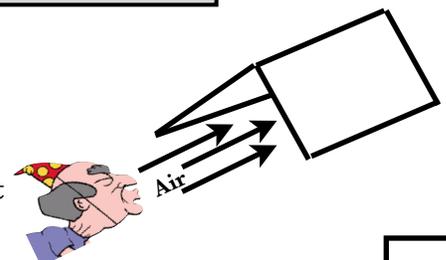


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* The paper strip will move _____. This will happen because the _____ above the strip of paper will move _____ than the air _____ the strip of paper. Fast air is less _____ than slow air. The paper strip wants to _____ because of _____, but it bumps against a pocket of _____ dense air and moves in the _____ direction.

4. You blow through the opening of a folded index card. What will happen to it and why?

Word List: underneath * faster * flatten * underneath * dense * less



6

* The index card will _____. This will happen because the air _____ the card will be moving _____ than the air above the card. The more _____ air on top will push down against the _____ dense air _____.

Part F: The Big Question (___ / 13)



I. Describe, scientifically, how an airplane flies.

Word List:
reaction * below * more * upward * dense * more
above * bumps * slower * more * action * lift * faster

* An airplane lifts upward when the air moving _____ the wings is moving faster than the air moving _____ them. When the air is moving _____ above the wings the air becomes less _____, while the _____ moving air underneath the wings is _____ dense.

Because slow moving air exerts _____ pressure than fast moving air, it creates an imbalance of forces that causes the plane to _____. Gravity makes the wing want to fall, but it _____ against the _____ dense air. Because of the law that states, “For every _____ there is an equal and opposite _____,” the wing actually moves _____.

Part G: Steering An Airplane (___ / 3)

The flight pattern of the plane is described for you. Indicate the positioning of each of the steering devices that would achieve the given flight pattern.

I. The pilot is taking off down the runway and wants the plane to pitch upward and climb.

Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight



Part G: Steering An Airplane (Continued) (___ / 6)

The flight pattern of the plane is described for you. Indicate the positioning of each of the steering devices that would achieve the given flight pattern.

2. While still climbing the pilot gently rolls and yaws to the right.



Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight

3. The pilot maintains a straight course and a constant cruising altitude of 30 000 feet.

Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight



Part G: Steering An Airplane. (Continued) (___ / 9)

The flight pattern of the plane is described for you. Indicate the positioning of each of the steering devices that would achieve the given flight pattern.

4. The pilot starts to make a gradual pitch downward while maintaining a straight course.

Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight



5. The pilot must gently yaw and roll to the left at constant altitude to make his final approach.

Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight



6. The pilot positions the plane to land, with the nose up and the tail down.

Ailerons:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Elevators:

- a. Both up
- b. Both down
- c. Right up/Left down
- d. Right down/Left up
- e. Both level
- f. None of these

Rudder:

- a. Right
- b. Left
- c. Straight



Part H: Spiritual Insight (___/12)

*He has showed you, O man, what is good. And what does the Lord require of you?
To **ACT JUSTLY** and to **LOVE MERCY** and to **WALK HUMBLY** with your God.
Micah 6:8*

1. Compare the three forces that are in action, when a plane is in flight, with the spiritual laws that God calls us to follow in Micah 6:8 (___/9)

GRAVITY

The force that moves an object _____.

The spiritual law that matches the natural law is to:



THRUST

The force that moves an object _____.

The spiritual law that matches the natural law is to:



LIFT

The force that moves an object _____.

The spiritual law that matches the natural law is to:

2. There is a spiritual force that keeps believers from moving toward the abundant life, just like the physical force of drag works against an airplane. But God gives us two instructions in James 4:7 that move Satan out of the way. (___/3)

DRAG

The force that keeps an object from moving _____.

Satan keeps us from moving toward an abundant life,
but God gives us two instructions in James 4:7
that move him out of the way.

They are:

_____ to God & _____ the devil