

# A Day at the Alberta Aviation Museum



## Alberta Grade Six School Program

### STUDENT PACKAGE

At the Alberta Aviation Museum, you will have the opportunity to see the aircraft exhibits up close, while learning about aviation theory. Please remember:

- Be respectful of the exhibits.
- Do not run in the museum.
- Consume food and drinks in the Education Area only.

And most importantly - Have Fun!

**Alberta Aviation Museum**  
**Grade Six Program**

**Aircraft Exercise Questions**

**1. Balloon**

- a. Describe the shape of the balloon in flight.
- b. What forces the balloon into that shape?
- c. What is the lifting force?
- d. What do the instruments (gauges) in the basket measure?
- e. How does the pilot control the altitude of the balloon?
- f. What do the tanks in the basket hold?

**2. Beech 18 or C-45 Aircraft (Lethbridge Air Service)**

- a. What type of engine provides the power?
- b. What is the skin of the elevator made of?
- c. What feature helps to streamline the aircraft in the air?

### **3. Barkley Grow (Yukon Queen)**

- a. What parts of the airplane have been streamlined?
  - I.
  - II.

### **4. De Havilland Mosquito (Hairless Joe)**

- a. What material has been used to construct the fuselage?
- b. What are the advantages of using this material?
- c. What are the main drag-reducing features of this aircraft?

### **5. Vickers Viking (Amphibian)**

- a. Describe the fuselage design or what does the fuselage look like?
- b. How is the thrust system different from other aircraft in the museum?

### **6. Waco (Red and white biplane)**

- a. How is more lift produced on this aircraft?
- b. Are there any penalties for this additional lift?

## **7. Fairchild 71C (Folding Wings)**

- a. What are the fuselage and tail covered with?
- b. Name the components of the tail that DO NOT move.

## **8. Cranwell (One side of the fuselage has no covering skin)**

- a. The internal structure looks quite fragile. Why not make it sturdier?
- b. What is the purpose of the criss-crossed wires?

## **9. F86 Sabre (swept wings)**

- a. What feature on this aircraft can deliberately create drag?
- b. Why is the aircraft not fabric covered?
- c. By sweeping the wings back, it allows what?
- d. What is the type of propulsion system?

## **10. Avro Anson (Twin engine, yellow aircraft)**

- a. What is the purpose of the flat surfaces hanging down from the trailing edge of the wings?

## **Physics of Flight**

**1. List the four main forces of flight with a brief explanation of each:**

a.

b.

c.

d.

**2. Wings provide lift for stable flight. Explain the role of ailerons and how they work with wings in flight.**

**3. Horizontal stabilizers keep the aircraft in level flight. Explain use of the elevators as a control surface at the trailing edge of the stabilizer.**

**4. Explain the role of the rudder in flight.**

**5. Contrast the ways that ailerons and elevators move. Explain why the difference is necessary.**

a. Ailerons move...

b. Elevators move...

**6. Draw the airflow around the wing cross section shown below and use Bernoulli's Principle to label the areas of Faster Air, Slower Air and Lift.**



**7. On the above wing, as the Angle of Attack increase, the Centre of Lift shifts:**

a. forward

b. rearward

**8. To make a more stable wing, the overall shape is given a slight bend upward referred to as:**

9. Propeller blades have an airfoil shape like a wing. As the propeller spins, the air flow around the blade causes a \_\_\_\_\_ pressure in front of the blade and a \_\_\_\_\_ pressure at the back of the blade. The difference in pressures produces thrust. The faster the propeller spins, the greater the force of thrust.

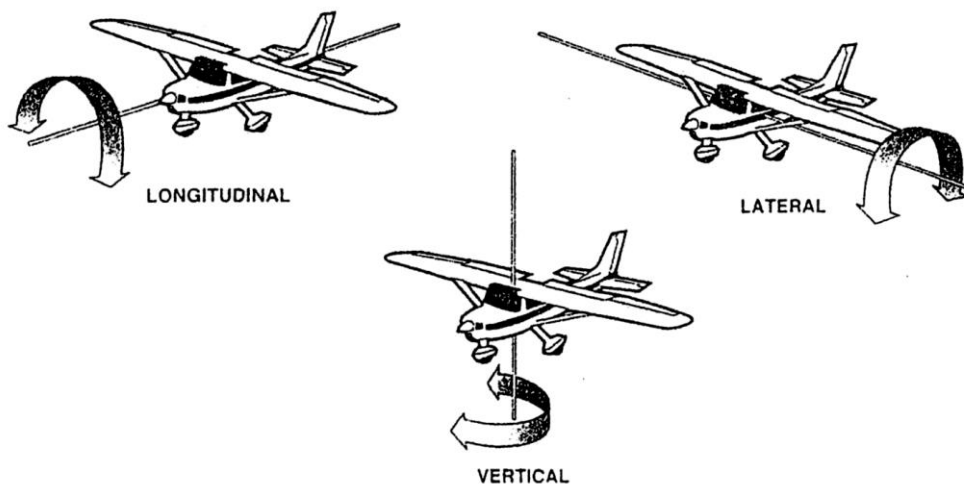
10. Label the Hub, Root, Leading Edge, Trailing Edge and Tip on the propeller diagram below:



11. Label the Ailerons, Vertical Stabilizer, Elevator, Rudder, Leading Edge, Nacelle and Empennage on the aircraft diagram below:



12. On the drawing below, label the control surfaces that produce movement on each axis:





## Glossary of Terms

**Ailerons** – Control movement on the longitudinal axis; movable control surface at the trailing edge of the main wing.

**Airfoil** – A shaped structure that creates lift by movement through the air (wing, propeller, stabilizers, etc.).

**Cockpit** – Forward part of the fuselage where the pilots are situated.

**Dihedral** – Slight upward angle of wings to increase stability.

**Elevators** – Control movement on the lateral axis; moveable control surface at the trailing edge of the horizontal stabilizer.

**Empennage** – Tail structure of an aircraft.

**Flap** – Retractable surface on the lower part of the wing used to increase lift for takeoff and drag for landing.

**Fuselage** – Body of the aircraft.

**Horizontal Stabilizer** – Small wings on the tail of an aircraft.

**Landing Gear** – Wheels, skis or floats (also called the undercarriage).

**Leading Edge** – The front edge of an airfoil.

**Nacelle** – Engine enclosure.

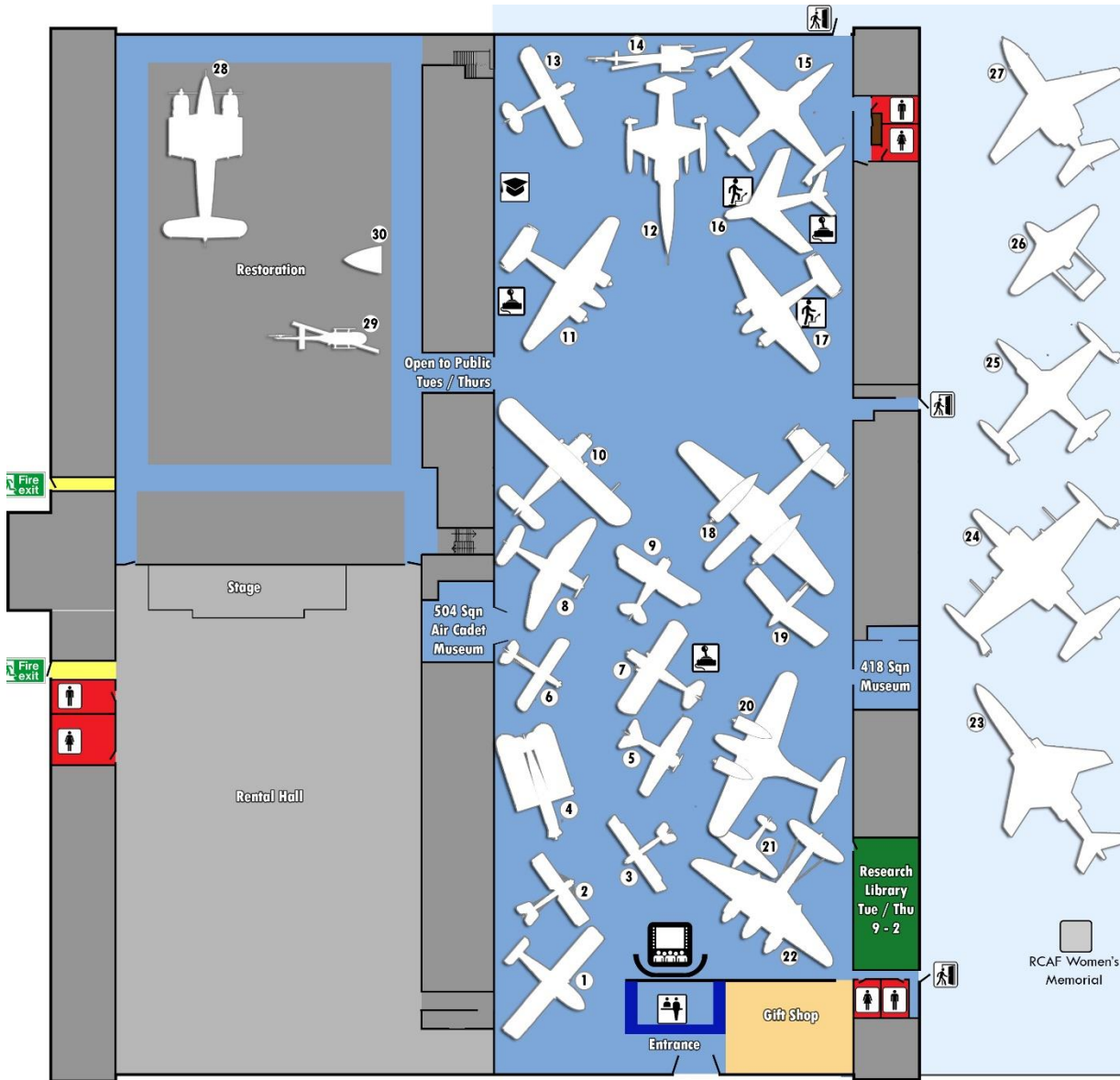
**Rudder** – Controls movement on the vertical axis; moveable control surface at the trailing edge of the vertical stabilizer.

**Trailing Edge** – The rear edge of an airfoil.

**Vertical Stabilizer** – Vertical fin at the rear of the aircraft.

**Wheel Pants** – Streamlined enclosure around the wheels on an aircraft where landing gear cannot be retracted.

# Alberta Aviation Museum Map



## Alberta Aviation Museum Visitor Map

- Indoor Displays
- Outdoor Displays
- No Public Access
- Blatchford Tales Theatre
- Interior Access Available
- Flight Simulator
- Education Area
- Exit to Outdoor Displays

1. Vickers Viking IV (7/8 Scale)
2. Curtiss Stinson Special
3. Curtiss Jenny (2/3 Scale)
4. Fairchild 71C
5. Fokker D.VIII
6. Cranwell CLA.4
7. Fleet 80 Canuck
8. Stinson SR-9 Reliant
9. Waco UIC
10. Noorduyt Norseman
11. Barkley-Grow T8P
12. Lockheed F-104 Starfighter
13. Piper PA-18 Super Cub
14. Bell 47
15. Canadair CT-133 Silver Star
16. Canadair Sabre
17. Beech-18
18. B-25 Mitchell
19. DeHavilland Tiger Moth
20. Avro Anson
21. Sindlinger HH-1
22. DeHavilland Mosquito
23. McDonnell CF-101 Voodoo
24. Avro Canada CF-100 Canuck
25. Canadair CT-133 Silver Star
26. DeHavilland Vampire
27. Beech-Hawker 125
28. Lockheed PV-1 Ventura
29. Bell 206
30. Douglas DC-6B Cockpit