The Day Tamias Looked Up

A Story of Dreams, Airplanes, and Learning to Fly

APPENDICES FOR AUDIOBOOK LISTENERS

The Flying Explorers Series – Volume 1

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Toad University Press

Appendix A — Flight Training Concepts (Book 1)

This story is fiction.

The airplane is not.

Everything you saw Tamias learn in this book is based on real aviation training—just scaled down, simplified, and explained in a way a young reader can actually follow.

This appendix collects the major training concepts from Book 1 in one place, so you can review them like a real student pilot.

The 20% Scale Rule (The Most Important Rule in the Whole Book)

At Toad University, the airplanes are **exact scale models** of real human aircraft.

That means the miniature Cessna 172 in this book is built so accurately that:

- the parts are in the same places
- the controls work the same way
- the systems are arranged the same way
- the procedures are the same

The biggest difference is **size**.

In this series, we use a simple rule:

Everything is 20%.

So if the manual says something is 30 feet long, the miniature version is 6 feet long.

If the manual says a runway is 3,000 feet, the TU runway is 600 feet.

A human pilot is about 68 inches tall, Tamias is about 7 inches tall.

That's why the airplane fits him. He's a little small for it, but the pillow helps.

That's also why the training still makes sense.

If you're reading with adult guidance:
Ask your guide to help you pick a few numbers from the story and "scale them" by 20%. This is

exactly how real engineers think. Remember, the easiest way to find 20%, is to take 10% (move the decimal in any number one to the left) and double it.

So…math review time…10% of 50 is…5. Double that, 10. So, 20% of 50 is 10. Make sense?

The Airplane Is a System (Not a Magical Object)

When Tamias first sees the Cessna, it looks like one thing.

A machine.

A shape.

A miracle.

But aviation training teaches you to see an airplane differently.

An airplane is:

- a structure
- a set of moving control surfaces
- an engine and fuel system
- instruments
- rules and procedures

It isn't "one thing."

It's **many smaller systems working together**.

And if one system fails, the pilot needs to notice, understand, and respond correctly.

That is why aviation training is so disciplined.

The Three Motions of an Airplane: Pitch, Roll, and Yaw

Airplanes do not move like cars.

Cars mainly move in two ways:

- forward

- left/right

Airplanes move in three main ways:

Pitch

Pitch is the nose moving **up or down**.

Pitch controls whether the airplane points toward the sky or toward the ground.

Roll

Roll is the airplane's wings tilting.

Roll controls whether the airplane banks left or right.

Yaw

Yaw is the nose turning **left or right**, like shaking your head "no."

Yaw is controlled by the rudder and the pilot's feet.

A huge part of early flight training is learning to picture these three motions in your mind clearly.

Because if you can't picture them, you can't control them.

The Yoke (A Steering Wheel in Three Dimensions)

The yoke is the main control in front of the pilot.

It looks a little like a steering wheel, but it is more powerful.

The yoke controls:

- **roll** (left/right movement of the yoke)
- **pitch** (push/pull movement of the yoke)

In other words:

- Rotate the yoke left → the airplane rolls left
- Rotate the yoke right → the airplane rolls right
- Pull back → the airplane pitches up

- Push forward → the airplane pitches down

It's simple in theory.

It takes practice in real life.

Rudder Pedals (Your Feet Control Direction)

In a car, your feet mostly control speed.

In an airplane, your feet control **yaw**.

That's what the rudder pedals do.

They move the rudder, which is a control surface on the tail.

One of the first surprising things student pilots learn is this:

Flying uses your hands and your feet at the same time.

Control Surfaces (The Airplane Is Controlled by Air)

This is one of the most important ideas in aviation:

Pilots do not "push the airplane around."
They **shape the airflow** around the airplane.

Ailerons

Ailerons are on the wings.

They control roll.

They work as a pair:

- one goes up
- the other goes down

This changes lift on each wing and makes the airplane roll.

Elevator

The elevator is on the horizontal tail.

It controls pitch.

This part surprises many new students:

The elevator does not "push the nose up."

Instead, it changes airflow so the **tail moves**, and the nose responds like a lever.

Rudder

The rudder is on the vertical tail.

It controls yaw.

It turns the nose left or right.

Flaps (Helpful, But Not Magic)

Flaps are on the wings, closer to the fuselage.

They help the airplane during:

- takeoff
- landing

Flaps change the shape of the wing so the airplane can fly safely at slower speeds.

But flaps come with a cost.

They add **drag**, which is air resistance.

That means flaps help you in one way, but they also make the airplane "work harder" in another.

Aviation is full of tradeoffs like this.

The Manual (POH) Is Not Optional

In the story, Tamias carries the manual everywhere.

That is not a joke.

In real aviation, the manual is called the **POH**:

Pilot's Operating Handbook

The POH contains:

- operating limits
- performance numbers
- procedures
- emergency steps
- approved configurations

Aviation does not run on "what you remember."

It runs on what is written, tested, and approved.

The FAA (The Rule System Behind the Rule System)

Tamias notices a term in the manual:

FAA APPROVED

FAA stands for:

Federal Aviation Administration

It is a human government organization that:

- writes rules for flying
- decides what training is required
- decides what equipment is acceptable
- investigates problems and accidents
- enforces aviation law
- staffs the control towers at airports and other facilities. Professionals called "Air Traffic Control Specialists" (usually referred to as Air Traffic Controllers) work in towers, radar rooms, and in support positions to keep the skies safe, orderly, and expeditious. In that order.

You don't have to love the FAA.

But you do have to respect what it represents:

Aviation is regulated because the sky is not forgiving.

Weather Comes First

Esquilo says something important before the flight:

He checked the weather carefully.

This is real pilot thinking.

Even a perfect airplane can become unsafe if the weather is wrong.

Weather affects:

- visibility
- wind
- turbulence
- clouds
- rain and icing
- how well the airplane performs

A real pilot checks weather before every flight.

Not casually.

Carefully.

If you're reading with adult guidance:
Ask your guide what "good flying weather" means. (This can lead to a great discussion about clouds, wind, and visibility.)

The Walkaround (Preflight)

Before any flight, pilots inspect the airplane.

This is called:

- the **preflight**
- or the **walkaround**

Esquilo checks the airplane like a professional.

He checks:

- control surfaces (ailerons, elevator, rudder)
- fuel quantity (visually)
- fuel caps
- pitot tube and static ports
- oil
- propeller condition
- tires and landing gear
- general aircraft condition

This isn't paranoia.

This is how you prevent problems before the airplane leaves the ground.

Checklists (The Most "Pilot" Thing in the World)

A checklist is not for beginners.

It's for professionals.

Pilots use checklists because:

- human memory fails
- people get distracted
- people get tired
- people rush
- people assume

A checklist forces you to slow down and confirm reality.

That's why Esquilo reads the checklist aloud.

He isn't being dramatic.

He is being correct.

The Runup (Proving the Engine Is Ready)

Before takeoff, Esquilo performs a **runup**.

This is when the airplane is held in place and the engine is tested.

The point of a runup is to confirm:

- the engine is producing power correctly
- the magnetos are functioning (similar to spark plugs or electronic ignition in cars)
- instruments show normal readings
- nothing sounds wrong

The runup is one of the last chances to catch a problem while still on the ground.

Runups will vary greatly by aircraft, and are not usually done in jet powered aircraft. At least not the same way.

"Your Airplane / My Airplane" (Transfer of Control)

Esquilo teaches Tamias a rule that every pilot learns:

When control is transferred, it must be unmistakable.

In real training, pilots often use words like:

- "You have the controls."
- "I have the controls."

In this book, the rule is even sharper:

If Esquilo says **"my airplane,"** Tamias must release the controls immediately.

This is not about authority.

It's about safety.

Because hesitation in the air can be dangerous.

First Flight: Why It Feels So Unreal

Tamias's first flight is not described as a loud celebration.

It's described as something quieter:

A shift.

A new view of the world.

That is exactly what first flight feels like for many real pilots.

The ground looks peaceful.

The airplane feels smooth.

The sky feels welcoming.

And that is when a good instructor teaches the most important lesson:

When flying looks easy, that is when you must be most disciplined.

What Tamias Really Learns in Book 1

This is the true achievement of Book 1:

Tamias does not "become a pilot."

He becomes something more important.

He becomes a student of aviation.

He learns:

- to study carefully
- to respect rules
- to respect procedures

- to respect weather
- to respect the airplane
- and to respect what he does not yet know

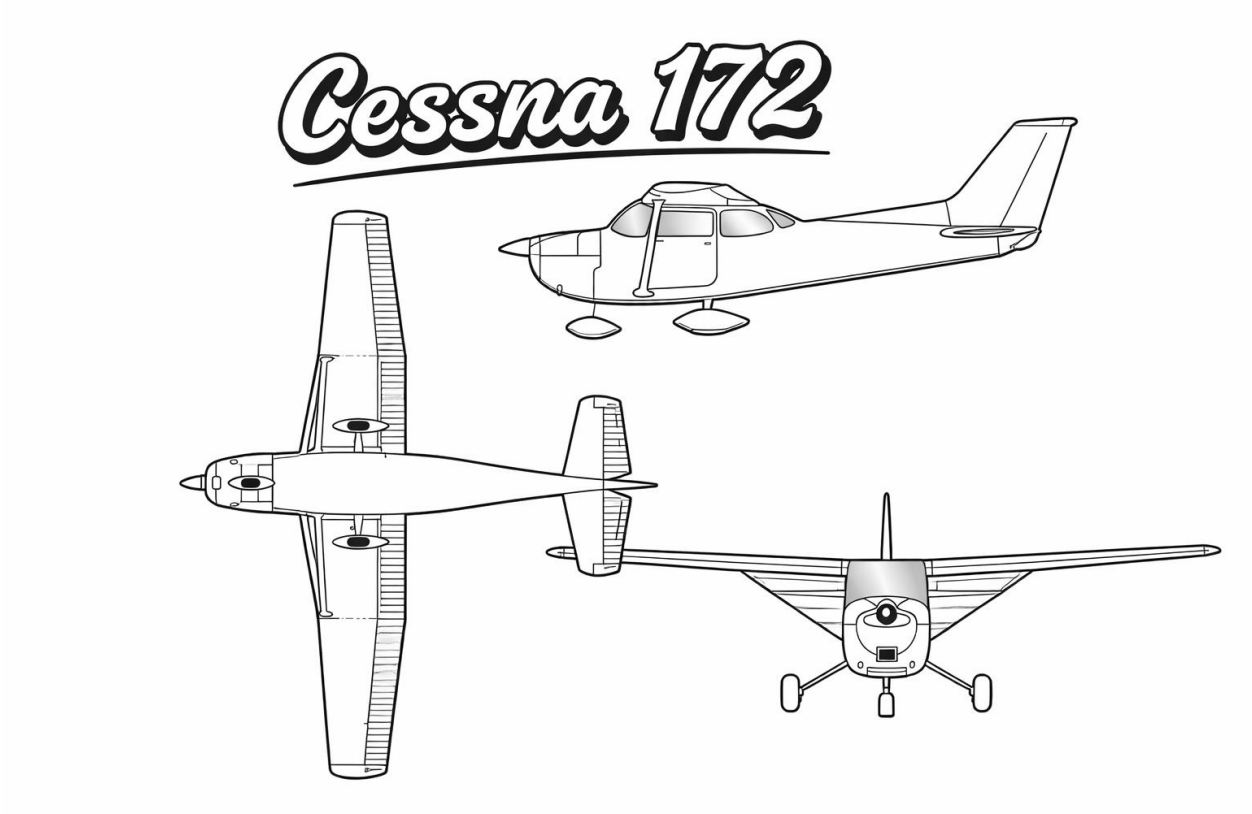
That is how real flight training begins.

And that is why the story ends in the sky.

Because the beginning of aviation is not the first landing.

It's the moment you decide:

I will learn this correctly.


Cessna 172

Appendix B — Glossary of Aviation Terms

Aileron — A hinged control surface on the outer part of each wing. Ailerons move in opposite directions to roll the airplane left or right.
Airworthiness Certificate — An official document that proves an aircraft is legally allowed to fly. It must be carried in the airplane.
Altimeter — An instrument that shows how high the airplane is above sea level, based on air pressure.
Approved — In aviation, "approved" means allowed by the official rules and authorities. It does not mean "someone thinks it's fine."
Attitude — The airplane's position compared to the horizon (nose up, nose down, wings level, banked, etc.).
Attitude Indicator — An instrument that shows the airplane's attitude using a small artificial horizon.
Avionics — The electronic equipment in an airplane, especially radios, navigation tools, and transponders.
Axis (Axes) — The three invisible lines an airplane rotates around: pitch, roll, and yaw.
Baggage Compartment — A storage space in the airplane, usually behind the seats.
Beacon — A flashing red light on the airplane used to warn others that the engine is starting or running.
Brake(s) — Controls that stop the airplane while on the ground. Airplanes use brakes mainly during taxi and after landing.
Cabin — The inside of the airplane where the pilot and passengers sit.
Checklist — A written list of steps pilots follow to make sure important actions are not forgotten. Checklists exist because human memory is not reliable under pressure.
Circuit Breaker — A safety device that stops electricity from flowing if there is a problem, to prevent damage or fire. Many airplanes have small push-button circuit breakers.
Climb — Flying upward to gain altitude.
Cockpit — The front part of the airplane where the pilot sits and controls the aircraft.
Control Surface — A moving part of the airplane (like an aileron, elevator, or rudder) that changes airflow to control the aircraft.
Control Wheel Lock — A device that locks the yoke in place when the airplane is parked, so the controls don't move in wind. It must be removed before flight.
Correct — In aviation, "correct" means the proper, approved way—not "close enough."
Cowling — The outer cover around the engine.
Crosswind — Wind blowing across the runway rather than straight down it. Crosswinds make takeoff and landing harder.
Drag — Air resistance that slows the airplane down.
Elevator — A hinged control surface on the horizontal tail. It controls pitch (nose up or nose down).
Empennage — A formal aviation word for the tail assembly of an airplane (including the horizontal and vertical stabilizers and their control surfaces).
Engine — The machine that provides power for the airplane. In many Cessnas, it turns the propeller.

Engine Instruments — Gauges that show engine health, such as oil pressure, oil temperature, RPM, and fuel flow.
FAA — Federal Aviation Administration. A U.S. government organization that makes and enforces rules for aviation.
FAA Approved — A phrase meaning something meets FAA requirements. It does not mean "recommended." It means officially accepted under aviation rules.
Finals Week — The last week of a school term, when exams and major projects are due.
Flap — A hinged surface on the inner trailing edge of the wing. Flaps change the wing shape to help with takeoff and landing at slower speeds, but they also add drag.
Flight Controls — The parts a pilot uses to control the airplane: yoke, rudder pedals, and sometimes other levers or trim controls.
Flight Instruments — The gauges on the panel that help a pilot understand what the airplane is doing.
Flow (Procedure Flow) — A memorized pattern of checking or setting items in the cockpit, often used before verifying with a checklist.
Fuselage — The main body of the airplane.
Gauge — An instrument that shows a measurement, such as fuel level or oil pressure.
Heading — The direction the airplane's nose is pointing, usually measured in degrees.
Heading Indicator — An instrument that shows the airplane's heading using a gyro.
Horizon — The line where the ground and sky appear to meet.
Ignition — The system that starts and keeps the engine running, including the key or switch that activates it.
Ignition Switch — The key or switch used to start the engine.
Instrument Panel — The section in front of the pilot containing flight and engine instruments.
Landing Gear — The wheels (or skis/floats) that support the airplane on the ground.
Lift — The aerodynamic force created by the wings that holds the airplane up.
Lights (As Required) — A checklist phrase meaning certain lights should be used depending on conditions and rules.
Magneto — A device that helps create spark for the engine. Many piston airplanes have two magnetos for redundancy. During runup, pilots check each magneto separately.
Main Landing Gear — The two main wheels under the airplane that support most of the weight.
Master Switch — The main electrical power switch for the airplane.
Mixture — A control that adjusts the ratio of fuel to air going into the engine.
Mixture — Rich — A checklist setting meaning the mixture is set to provide plenty of fuel for engine operation, often used for start and takeoff at low altitude.
Nose Gear — The wheel under the front of the airplane.
Oil — A fluid used to lubricate the engine and prevent damage from friction and heat.
Oil Pressure — A measurement showing whether oil is circulating properly through the engine.
Oil Quantity — The amount of oil in the engine. Pilots check this before flight.
Parking Brake — A brake setting that holds the airplane still during runup.
Pitch — The airplane's nose moving up or down.
Pilot — The person controlling the airplane.
Pilot's Operating Handbook (POH) — The official manual for a specific airplane model. It includes limitations, procedures, and performance information.
Pitot Tube — A small tube on the airplane that measures air pressure to help determine airspeed. It

must be clear and unobstructed.
Preflight — The inspection of the airplane before flight.
Propeller — The spinning blades at the front of many airplanes. A propeller produces thrust by pushing air backward.
Push/Pull — How the yoke is moved forward and backward to control pitch.
Radio — A communication device used by pilots to talk to air traffic control or other aircraft.
Radios — Set — A checklist item meaning radios are tuned and ready.
Registration — An official document proving the aircraft is registered legally. It must be carried in the airplane.
Rudder — A hinged control surface on the vertical tail that controls yaw.
Rudder Pedals — Foot pedals in the cockpit used to control the rudder and yaw.
Roll — The airplane's wings tilting left or right.
Rotation — The moment during takeoff when the pilot raises the nose and the airplane lifts off.
RPM — Revolutions per minute. A measurement of how fast the engine (and propeller) is turning.
Runup — A procedure performed before takeoff where the engine is tested at higher power while the airplane is held still.
Runway — A long, flat strip of ground used for takeoff and landing.
Seatbelt — A safety strap used to hold the pilot and passengers in place.
Secure — In aviation, "secure" means properly fastened, locked, or confirmed—not just "probably okay."
Spinner — The rounded cone at the center of the propeller that improves airflow and covers hardware.
Static Port — A small opening on the airplane that measures outside air pressure for instruments like the altimeter.
Steer — To control direction while on the ground, usually with rudder pedals and nose wheel steering.
Strut — A support beam. On many Cessnas, wing struts help hold the wings up.
Suction — A system (often vacuum-based) used to power certain gyroscopic instruments in some airplanes.
System — A group of parts working together. Aviation is built around systems.
Takeoff — The process of accelerating down the runway until the airplane lifts into the air.
Taxi — Moving the airplane on the ground under its own power.
Throttle — A control that adjusts engine power.
Throttle — Idle — The lowest power setting.
Throttle — 1000 RPM — A common low power setting after start.
Throttle — 1700 RPM — A common runup power setting in many Cessna checklists.
Thrust — The force that moves the airplane forward.
Tire — The rubber wheel covering. Pilots inspect tires before flight.
Trim — A control that helps the airplane hold a desired attitude without constant pressure on the yoke.
Trim Tab — A small movable surface on the elevator that helps with trim.
Trim — Set for Takeoff — A checklist item meaning trim is set to the correct position for a safe takeoff.
Turn Coordinator — An instrument that shows rate of turn and coordination.
VFR — Visual Flight Rules. Flying by looking outside and maintaining visual references, usually in

clear weather.
Vertical Stabilizer — The upright fin on the tail. It helps keep the airplane stable in yaw.
Vertical Speed Indicator (VSI) — An instrument that shows how fast the airplane is climbing or descending.
Weight & Balance — Information showing how heavy the airplane is and how the weight is distributed. Too much weight or wrong balance can make flying unsafe.
Wing — The part of the airplane that produces lift.
Wing Strut — A support beam connecting the wing to the fuselage on many Cessna models.
Wing Tip — The outermost end of the wing.
Yaw — The nose turning left or right.
Yoke — The main control used by the pilot to control pitch and roll.

Cessna 172R Gauge Cluster

Primary instruments:



Airspeed indicator



Attitude Indicator



Altimeter



Turn Coordinator **Heading Indicator** **Vertical Speed Indicator**

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About the Author

David I. Schoen, known to generations of students as *Professor Dave*, has spent decades helping learners of all ages discover clarity, confidence, and even a little joy in the worlds of language, math, and learning. A veteran educator, tutor, writer, and unapologetic lover of books, he specializes in turning complicated ideas into simple, friendly explanations that actually stick.

Professor Dave has guided thousands of students through English, math, writing, grammar, test preparation, and the always-adventurous process of becoming a stronger thinker. His teaching blends humor, precision, and storytelling — a combination that has helped learners from elementary school through adulthood feel empowered instead of intimidated.

He is also an active private pilot, and has been flying for over 35 years — an experience that has shaped the realism, detail, and sense of wonder behind *Tamias Learns to Fly* and *The Flying Explorers Series*. Before becoming an author and educator, he worked as an Air Traffic Controller at JFK International Airport, one of the world's busiest airports, for almost two decades. Aviation is in his blood, like it is slowly coming to be in Tamais'.

When he isn't teaching or writing, Professor Dave can usually be found creating new educational books, experimenting in the kitchen, playing the piano, or working on inventive projects that combine family, learning, and fun. He lives on Long Island, New York, where he is constantly surrounded by stories waiting to be told.

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