



11th Grade Aviation STEM Curriculum Materials – Semester 2: PILOT

Unit 6 - Navigation: Plotting, Pilotage, and Paperwork

Lesson 6.B.1 Makeup of the Atmosphere

- Sporty's Sectional Training Chart for each student or pair of students
- Local Sectional Aeronautical Charts for each student or pair of students
- VFR Sectional Plotter with Rotating Azimuth Wheel
- Ruler for each student or pair of students
- Protractor for each student or pair of students

Flight Simulation Activity: Student Activity 7

- Computer with flight simulation software or flight simulator
- Joystick or yoke
- Optional: Throttle quadrant, rudder pedals, additional monitors

Lesson 6.B.2 Which Way to Steer?

- VFR sectional chart (local area, Memphis, or any)
- Aeronautical chart plotter with rotating azimuth wheel
- Box fan and balsa gliders

Solving the Triangle Activity: Student Activity 4 (per student)

- Paper
- Protractor
- Straightedge or ruler

- Computer with flight simulation software or flight simulator
- Joystick or yoke
- Optional: Throttle quadrant, rudder pedals, additional monitors

Wind Correction Diagramming Activity: Student Activity 7 (per group)

- Card stock
- Ruler
- Protractor
- Tape
- Scissors

Lesson 6.B.3 Flight Computers

- VFR sectional aeronautical chart (any area is suitable, but one covering the local area is preferable)
- Aeronautical chart plotter with rotating azimuth wheel
- E6-B manual flight computer

Flight Simulation Activity: Student Activity 3

- Computer with flight simulation software or flight simulator
- Joystick or yoke
- Optional: Throttle quadrant, rudder pedals, additional monitors

Lesson 6.C.1 Plotting Your Course

- VFR sectional aeronautical chart (any area is suitable, but one covering the local area is preferable)
- Plotter
- E6-B manual flight computer

Lesson 6.C.2 Helpful Documents

- E6-B Flight Computer (manual or electronic)
- VFR sectional charts for local area (digital or paper)
- Chart Supplement for local area (digital or paper)
- Plotter

Lesson 6.C.3 VOR and GPS Navigation

- VFR sectional aeronautical chart (any area is suitable, but one covering the local area is preferable)
- Chart Supplement
- Protractor
- Pencil, ruler indicating centimeters

Unit 7 - Aircraft Performance

Lesson 7.A.1 Weight and Balance

- Calculator

Student Activity 2

- 5 whiteboards or pieces of chart paper
- Markers

Lesson 7.A.2 Density Altitude

- E6-B Flight Computers

Unit 8 - Aeromedical Factors: Am I Safe to Fly?

Lesson 8.B.1 It's Getting Harder to Breathe

It Depends on Oxygen: Student Activity 1 (per group)

- Freestanding candle
- Two large drinking glasses, Mason jars, or similar
- Matches or lighter
- Dry ice and insulated gloves; or
- Baking Soda (2 tablespoons)
- Vinegar (1 cup)

Lesson 8.B.2 Your Eyes are Deceiving You

- Quarters
- Tape

Student Activity 3: Runway Illusions (per group)

- Camera (cell phone camera okay)
- Tripod
- Set of 3 paper runways
- You may print out the images in the PDF titled 3runwaywidths, or you may create your own.
- Tape
- Wedge

Student Activity 4: Runway Illusions Simulator Scenarios

- Computer with flight simulator software or flight simulator
- Joystick or yoke
- Optional: Throttle quadrant, rudder pedals, additional monitors

Student Activity 5: How Do You See It? (per student)

- 10 index cards
- Pens or markers

Lesson 8.B.3 Disorientation and Motion Sickness

Disorientation and Motion Sickness Teaching Aid 1

- Chair with rotating seat, similar to an office chair
- Blindfold or sleeping eye mask
- Ginger candies
- Peppermint candies
- Small paper bags, or immediate access to a trash can

Disorientation and Motion Sickness Teaching Aid 2

- 1 gelatin ring mold or tube cake pan
- 2 metal washers ($\frac{3}{8}$ " diameter hole)
- 1 plastic soft drink straw
- 1 wooden craft stick
- 1 hot glue gun and appropriate glue stick
- 1 paper clip
- 1 utility knife
- 1 "Lazy Susan" turntable
- Water to fill gelatin ring mold

Unit 10 - Private Pilot Projects

Lesson 10.B.1 Career Portfolio Development

Portfolio Materials (for each student who has not already created a portfolio)

- Three-ring binder
- Tabs (as needed per student based on table of contents)
- Plastic or vinyl sheet protectors
- Access to computers, printers, and scanners for the creation of portfolio materials