EO C231.01 – OPERATE AN EXPERIMENTAL WING

1. **Performance**: Operate an Experimental Wing

2. **Conditions**:

   a. Given:

      (1) Materials to create airfoils for testing;

      (2) Material and plans for constructing a wind tunnel;

      (3) Two multi-speed fans;

      (4) Supervision; and

      (5) Assistance as required.

   b. Denied: N/A.

   c. Environmental: Suitable classroom facilities or training area large enough to accommodate the entire group.

3. **Standard**: In accordance with specified references the cadet shall:

   a. build an experimental wing; and

   b. operate the experimental wing.

4. **Teaching Points**:

TP	Description	Method	Time	Refs
TP1	Identify the five parts of a wind tunnel, to include: a. settling chamber; b. contraction cone; c. test section; d. diffuser; and e. drive section.	Interactive Lecture	5 min	C-093
TP2	Have the cadets, working as a team, assemble a wind tunnel.	In-Class Activity	15 min	C-093
TP3	Have the cadets, as a member of a group of no more than four, form airfoil shapes for testing in the wind tunnel.	In-Class Activity	10 min	C3-091 (p. 31) C3-116 (p. 21)
TP4	Have the cadets place airfoils in the wind tunnel and compare lift and drag.	In-Class Activity	25 min	C3-093

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5. **Time**:

a.	Introduction / Conclusion:	5 min
b.	Interactive Lecture:	5 min
c.	In-Class Activity:	50 min
d.	Total:	60 min

6. **Substantiation**:

   a. An interactive lecture was chosen for TP1 to introduce wind tunnels and give an overview of them.

   b. An in-class activity was chosen for TP2 to TP4 as it is an interactive way to provoke thought and stimulate interest among cadets.

7. **References**:

   a. C3-091 (ISBN 1-55652-477-3) Carson, M.K. (2003). *The Wright Brothers for Kids: How They Invented the Airplane.* Chicago, IL: Chicago Review Press.

   b. C3-093 NASA. (1996). *NASA's Observatorium Teacher's Guide.* Retrieved 12 February 2007, from http://observe.arc.nasa.gov/nasa/aero/tunnel/tunnel_parts.html.

   c. C3-116 A-CR-CCP-263/PT-001 (ISBN 0-9680390-5-7) MacDonald, A. F. and Peppler, I. L. (2000). *From the Ground Up: Millennium Edition.* Ottawa, ON: Aviation Publishers Co. Limited.

8. **Training Aids**:

   a. Presentation aids (e.g. whiteboard/flipchart/OHP) appropriate for the classroom/training area;

   b. Cardboard boxes;

   c. Blank OHP slides;

   d. Duct tape;

   e. Two multi-speed fans; and

   f. Box cutter.

9. **Learning Aids**:

   a. File folders (letter-size);

   b. Tape;

   c. Stapler; and

   d. Locally available materials for constructing experimental wings.

10. **Test Details**: N/A.

11. **Remarks**: It is recommended that the two periods required for this EO be scheduled consecutively.

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